

1878.]

[No. 2.

BULLETIN

OF THE

American Geographical Society.

No. 11 West 29th Street.

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NEW YORK :
PRINTED FOR THE SOCIETY.
1878.

JAPAN: GEOGRAPHICAL AND SOCIAL.

BY

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Late of the Imperial University of Tōkiō, and author of "The Mikado's Empire."

In speaking to-night of Japan and her people—subjects which have occupied my attention during the last ten years, four of which were spent on the soil of Dai Nippon—I can but give a glimpse of many subjects connected with the geography and social life of the country.

I propose to present an outline of the history of Japan from the aboriginal period down to the tenth year of Meiji (Enlightened Peace), as the reign of the present emperor is chronologically and popularly designated. I shall then explain the circumstances attending the invitation extended to me by the Prince of Echizen—one of the provinces of the empire—to go out to his dominions to establish a scientific school upon American principles, and give some of my first impressions of the country and people. I shall then present before you the geographical features of the Archipelago of Japan, and detail my journeys through the country during the years 1870, '71, '72, '73, and '74. We shall then visit the people in their houses, and study their unique social life, sum up their virtues and faults, and thus estimate the moral character of a nation which bids fair to attempt the hazardous experiment of changing their civilization. A few words on our American policy, and the treaties in operation, the revision of which is now pending, will close my address.

In examining the question of the origin of the present Japanese people, we must look backward to a period long antedating their most ancient records. The oldest extant monuments of Archaic Japanese are the two books—almost the "Bibles" of the Japanese—the Kojiki (Book of Ancient Traditions) and the Nihongi (His-

tory of Japan), completed in the years 712 and 720 respectively. They are written with the Chinese character, as writing was introduced from China through Corea. The common native script and square characters, numbering forty-seven, and constituting the syllabary in daily use, was not fully invented or put to use until at least a century later. This syllabary is a phonetic one. In it are written the romances, easy histories, and the simpler popular literature. The more serious literary productions are expressed by the Chinese ideographs, which every well-educated Japanese can use and read. The modern language is a sort of hybrid or jumble of Sino-Japanese, which is a very different speech from that reflected from the pure native literature of the Middle Ages. As spoken by the women and by a few almost fanatical purists, it is Japanese, but slightly defiled by Chinese influence. In spite of the difficulties in his path, a foreigner can much more readily acquire a useful measure of spoken Japanese than of Chinese, as is evinced by the much larger proportion of foreign residents in Japan, as compared with those in China, who are able to retain on their tongues and memories the syllabled words of Japan ; while the fossilized baby-talk of the Chinese in "the unchanged monosyllables of the infancy of mankind" elude their grasp.

One of the first requisites in understanding the Japanese is a clear discrimination of them from the Chinese. The two peoples are entirely distinct in physique, temperament, history, development, language, and in very many of the traits and habits of life. A Japanese and Chinese can no more understand each other's speech than an American and Russian could understand each other. The Chinese look down with supreme contempt on the Japanese, and the islanders enjoy snubbing the continentals. The one are the French, the others the Englishmen of the East. "One is a decayed old gentleman, and the other is a conceited young upstart." The Japanese do *not* wear pigtaails—that badge of Manchiu conquest. They do *not* bind the feet of their women. They do *not* smoke opium. Here let me quote from the new Code of Japan : "Any one who, for the sake of the profit he may thereby acquire, sells the poisonous drug known as opium, regardless of the harm which it causes, shall, if a principal in the offence, be punished by decapitation; and if an accessory, by penal servitude for ten years; and any person who purchases and uses it, by penal servitude for two and a half years.

* * * Any one who incites or persuades another to smoke or eat opium shall be punished by hanging [a method of punishment lately introduced from Europe]. * * * In all cases any opium which may be discovered in the possession of the offender shall be confiscated." There are many more minute details which show how the Mikado's Government regard opium, which I need not quote. To continue: The Japanese temperament is lively, gay, mercurial, and their human nature seems to be of a type nearer ours than does the Chinese. They are a sort of "missing link" between the Mongolian and the Caucasian races. In their historic development also these insular people differ from their continental neighbors. The Japanese have never been invaded by a foreign foe. They have been ruled from ancient times by one, only one, dynasty—the nameless family of the Mikados, of whom the present ruler is the one hundred and thirty-third of the imperial line; whereas China has had thirty-three or thirty-four dynasties—several of them foreign—and her present emperor is the two hundred and seventy-fourth. Japan has never been tributary to China, as some inaccurate writers claim, and she is equally an "empire"—not a kingdom merely—like her neighbor, though a vastly smaller one. The Mikado not only rules his own subjects, who are homogeneous in blood and language, but also sways his sceptre over the Aino savages of Yezo and the Kuriles, and the Archipelago of Riu Kiu (Loo Choo). To finish these comparisons by a verdict as to which of the two is "the better people," or "the nobler race," is not within my province. We Americans are apt to like the Japanese best, since they flatter our vanity, on the principle that "imitation [of our civilization] is the sincerest form" of that delightful science of being tickled.

To return to the origin of the Japanese people: It is my belief, based upon studies and researches on the soil itself, in the field of archæology, the stone age, traditions, geographical names, manners and customs, and language, that the aborigines of the Japanese Archipelago are the men now called the Ainos, who inhabit Yezo and the outlying islands of northern Japan. They number about 20,000 in all. They are a short, thick-set race, with eyes set at a straight angle with the nose; with bushy beard and head-hair, but not more hairy as to their bodies than many Japanese or other peoples who eschew pantaloons and shirts. The "hairy" Kuriles or

Ainos is rather the pet phrase of some closet-writers than the expression of a fact. The Ainos or Ebisū (savages) are hunters and fishermen, as they were in most ancient times. They very probably once roamed over the main island of Japan, and were the people found by the conquering tribes who came from the Asiatic mainland, perhaps before the Christian era, or, as the Japanese claim, 660 B. C.

Who these conquerors were seems now apparently certain, as language—that potent solvent of so many ethnologic problems—witnesses that they came from Manchuria, down through Corea, into Japan. I quote from a review of my work, “The Mikado’s Empire,” written, I believe, by Mr. W. G. Aston, one of the Secretaries of the British Legation at Tōkiō, and the author of a standard “Grammar of the Written Language of Japan”:

“As regards the position of the Japanese language, it gives no dubious response. Japanese has all the structural and syntactical peculiarities common to the Alatian or Ural-Altaic group; and the evidence of the physiognomical tests points unmistakably to the same origin for the people. The short round skull, the oblique eyes, the prominent cheek-bones, the dark-brown hair, and the scant beard—all proclaim the Mantchus and Coreans as their nearest congeners. In fact, it is no longer rash to assert as certain that the Japanese are a Tungusic race, and their own traditions and the whole course of their history are incompatible with any other conclusion than that Corea is the route by which the immigrant tribes made their passage into Kiushiu from their ancestral Mantchurian seats.”

The invaders landing in Japan easily obtained mastery over the aboriginal people, though in many cases hard fighting was necessary. It was not, however, till the end of the ninth century that they had conquered as far as the northern end of the main island (Hondo). The victors, amalgamating with the conquered people, have formed the present Japanese people, who have all the characteristics of a mixed race.

The light of history, as revealed by the Kojiki, shows a state of feudalism prevalent. An imperial house in the western part of central Japan rule a space of territory included in what are now called the Kinai (Home Provinces), around Ozaka and Kiōto. Other provinces were held in fief by nobles or princes, tributary to the

Mikado's Court. One-ninth of the land was cultivated for the Mikado, whom the Kojiki, which details the national mythology, represents as the vicar and fellow of the gods—designating him as the Tennō (Son of Heaven).

At the opening of the seventh century the Japanese introduced the Chinese grades of nobility, and modeled their Court and etiquette largely from the same pattern. At the same time they introduced the Chinese centralizing system of government, and thus at once changed their feudal state to that of one governed by a monarch, with the eight ministries of the Palace, War, Rites, Justice, Treasury, &c. To bring the outlying tribes and semi-vassal chiefs and princes into obedience to this new state of affairs required long and costly wars through two centuries, during which two military families, the Taira or Heiki, and the Minamoto or Genji, with their rival red and white flags, rose into prominence. After long jealousies these clans came to feud, then to blows, and finally to a war of extermination. In a great naval battle, fought off Shimonoséki, in 1185, the Taira were annihilated, and the Minamoto, in the person of Yoritomo, their chief, became supreme. The latter erected his seat of military administration at Kamakura, twelve miles from the modern Yokohama. He received the appointment of *Sei-i Tai, Shōgun*, or Barbarian-chastising Commander-in-Chief—a title known in modern times to foreigners as *Tai-kun* or "Tycoon."

From the date 1192 begins that dual system of government in Japan which sorely perplexed foreigners, and gave rise to the literary fiction of "two emperors," though there never was but one sovereign—the Mikado.

The Minamoto family came to an end, in the third generation, in 1219. The reins of military power were next held by the Hōjō family, at Kamakura, from 1219 to 1333. A temporary mikadoate, with no shōgun, followed from 1333 to 1335, when the government lapsed into anarchy again, and two rival dynasties of the imperial house and their adherents rent the empire into two parts, and civil war raged for fifty-six years (1336-1392), when the imperial house was again united. The Ashikaga family made the office of Shōgun hereditary, and ruled in the name of the Mikado from 1335 to 1573, during which the institutions of feudalism were greatly developed and heraldry had its rise. Nobunaga and Hidéyoshi (Taikō sama)

next appear as loyal vindicators of the Mikado's supremacy, without being invested with the title of Shōgun. Tokugawa Iyeyasū followed up the work of Taikō, and in 1604 was appointed Shōgun. He founded the city of Yedo and the family that held the military power in Japan, ruling as the chief vassal of the Mikado, and first of all the daimiōs, or territorial dukes and barons, who were obliged to live in Yedo in a state of hostage. The Tokugawa Shōguns numbered fifteen in all, the last resigning in 1868—since which time there has been no "Tycoon."

The story of the advent and stay of Europeans in Japan has been too often told to be narrated here, as well as the origin, progress and ending of Roman Christianity, and the failure of the French and English and the monopoly of Dutch commerce with that country. Suffice it to say that, after the lapse of nearly two centuries and a half, it was discovered that the ashes of the faith once thought to be extinguished by the fires of persecution, and long since cold in oblivion, were still hot in the breasts of thousands of natives. They burst forth in 1870 and '71, when even the Mikado's government, in spite of the name Meiji (enlightened peace) given to his reign, began a series of severe persecutions. This policy, however, is now abandoned, and religious toleration is inscribed on the banners of New Japan. The tomb of Will Adams, the sturdy English pilot, has been discovered near Yokoska, and is now a local Mecca to tourists.* Many interesting trovers of antiquities and identifications of noted places, rendered famous in the history of Japanese Christianity and European intercourse, have been made through the zeal and study of enthusiastic residents, and especially by the members of "The Asiatic Society of Japan," with whom our Geographical Society exchange annual courtesies. A number of our fellow-Americans hold membership in both societies.

Of the causes leading to the revolution of 1868, the restoration of the Mikado to supreme monarchy, and the recent changes in the home and foreign policy of Japan, I have not time to speak.† I will mention that in 1868 the Mikado, at Kiōto, took an oath

* See page 26 in *The Yokohama Guide*, by the author, with full directions for visiting the spot.

† See Chapter XXVIII, "The Recent Revolution in Japan," in "*The Mikado's Empire*," Harper & Brothers.

before the assembled nobles of the Court and Empire to reform the government and nation, and that "Intellect and learning should be sought throughout the world, in order to establish the foundations of the Empire." That oath was the direct cause of my going to Japan. The Daimiō of Echizen, one of the leaders of the revolutionary movement and a liberal and enlightened ruler, immediately resolved to act on the permission thus given and employ foreign teachers. As soon as the civil war was over (the last and crushing blow to the rebels being given by the steam-ram *Stonewall*, purchased from the United States at Hakodaté), the Duke of Echizen being then one of the regents of the Imperial University of Tōkiō, made application through the Rev. Guido F. Verbeck, then Foreign Superintendent of the University, for a teacher of English, an instructor in the physical sciences, a physician and surgeon, and a military officer to teach drill, tactics and fortification. The speaker was chosen by the faculty of Rutgers College, to whom the application was forwarded, to fill the second position named; and was the only one of the four who was actually appointed to fill the office for the specified term of three years, as the feudal system was abolished and the other applications canceled before they were filled.

The speaker arrived in Japan, at Yokohama, December 29, 1870, and, after a three days' stay in Yokohama, rode up the Tōkaidō to Tōkiō, and there spent seven weeks. An after residence of three years made old Yedo and new Tōkiō more familiar even than old Manhattan and New York. Yedo, meaning "bay-door," was the chief city of the hermit nation of old Japan; not its capital. It was the central court-camp of a military chief, surrounded by his vassals. Kiōtō was the capital (*miako* or *kiō*). Since 1868 Japanese have not used the name "Yedo"; but, officially and popularly, the capital of Japan is called Tōkiō (Eastern Capital). Tōkiō—both in its appearance and significance, as well as in the life of the place and people—is an entirely different city from Yedo, though occupying the same site.*

At the present time five seaports and two cities are open to foreign residence; they are Yokohama, Nagasaki, Hiōgo (Kobé),

* See *The Tokio Guide and Map of Tokio*, with notes historical and explanatory, by the author. Yokohama, 1873.

Hakodaté, Niigata, with Ozaka and Tōkiō. The Japanese are quite ready to open the whole country to foreign trade and residence when the present treaties are satisfactorily revised. To Commodore Perry we are indebted for the opening of two ports to the shelter and provisioning of American sailors ; but it is to an honored Fellow of this Society, Townsend Harris,* that we owe the opening of the other ports to trade and commerce. There is no name, in all the history of the modern diplomatic and commercial relations of Japan with the outside world, of which both natives and foreigners may and do speak in terms of higher praise than the name of Townsend Harris.

The population of Japan, by official census of 1872, is somewhat over thirty-three millions, and the area of the empire is variously estimated from 150,000 to 200,000 square miles. The surface of the country is almost wholly made up of mountains and valleys. Over 3,400 islands are enumerated as constituting the archipelago. The Riu Kiu (Loo Choo) islands on the south, and the Kuriles on the north (ceded by Russia in exchange for the southern half of Saghalin), belong also to Japan. For purposes of administration, the country is divided into thirty-four "kens," or prefects. The Imperial Government consists of His Majesty the Mikado, the Dai Jō Kuan, or Supreme Council of the Government, and the subordinate ministers of Foreign Affairs, Imperial Household, Home, Treasury, Army, Navy, Education, Public Works, Justice, and the sub-department of Colonization (of Yezo and the Kuriles.) †

After seven weeks spent in Tōkiō, I took the steamers of the Pacific Mail Steamship Company to Kobé, though at present (1878) the natives have the steam coasting and North China trade in their own hands. I spent three days in Ozaka, and inspected the old castles of Taikō, and the Mint, at which over \$70,000,000 worth of milled and stamped (but unperforated) pieces, ranging in value from mills (*rin*) to double eagles (twenty *yen*), have been coined since 1871.

Ozaka is a city of canals. We took boats up the Yodo River to Hashimoto ; thence, by horseback, to Otsu, at the foot of Lake

* Now deceased.

† For detailed statistics relating to the resources, population, climate, soil, trade, etc., of Japan, see "*The Mikado's Empire*," pp. 579-618.

Biwa; thence, by a little steamer, across the lake (over sixty miles long) to the northern end; thence, by horse, to Tsuruga (soon, probably, to be an open port and a railway, perhaps a canal terminus). Thence, on horseback, we came to Fukui, the castled feudal capital of the dukedom of Echizen, a province noted for its silk, paper, lacquer, tea and cutlery. In this city I lived from March 4, 1871, to January 22d, 1872, and, except for a few weeks, the only foreigner in the province. I may say, with pardonable pride, that I am one of the few living foreigners who have seen Japanese feudalism at home.

The mammoth map which I exhibit before you this evening, is the coast-line map of Japan, made secretly by a native scholar during the Tokugawa days. At present excellent copperplate maps and charts are produced in the bureaus of the various governmental departments, and by private publishers, that rival the productions of European and American cartographers. With pardonable pride, the Japanese wreath their ornamental titles with the cherry-blossom (their national flower), and draw the true meridian at Tōkiō, computing their longitude east or west therefrom.

Here let me call attention to the fact that the most correct map of Japan ever made by a foreigner, is that of Mr. Henry Brunton, an English engineer who was for several years employed in the service of the Japanese Government, and who was a diligent traveler in the empire. It is a fine, large wall map, full of detailed information. Prof. Ernest Knipping, a German gentleman, and one of my colleagues in the Imperial University, is also engaged in the work of preparing a large map of Japan, to be published in Germany. Prof. Knipping has been for several years engaged in surveying, under Government auspices. Nor must I omit the name of Mr. Ernest Satow, the accomplished Secretary in the Japanese language to the British Legation, who has traveled much in the out-of-the-way places of Japan, and written thereon. In Yezo, American explorers, geologists, and travelers, under government auspices, have greatly added to our knowledge of this little known territory. These are Gen. Horace Capron, Prof. Benjamin S. Lyman, Prof. Henry S. Munroe, Prof. Thomas Antisell, Dr. Stuart Eldredge, Lieut. Murray Day, U.S.N., and Capt. James R. Wasson, U.S.A., who have made valuable reports to the Japanese Govern-

ment.* The native geographers themselves have during the last ten years paid great attention to the physical and descriptive geography of their country, and several new and excellent works have been published in Tōkiō during the last half-decade. Native writers apply the name Hondo (main land, or island) to the chief island, improperly designated "Nippon," "Nippon," "Nihon," "Nifon," by foreigners. The other important islands are Kiushiu, Shikoku, Yezo (or Hokkaidō), Iki, Tsushima, Sado, the Kuriles, Bonin Hachijō, etc. The division of the country into nine "dō," or circuits, corresponding to our "Eastern States," "Middle States," "Southern States," etc., is of very ancient origin, and is still in familiar and official use.

During my four years' stay in Japan, having a permanent passport, I spent all my vacations in journeying through the main island, visiting the sites famous in history or fiction, noted temples, districts noted for their silk, porcelain, bronze, lacquer, carved wood, cloisonné, or other industries, and studied with eager wonder the unique mechanical, industrial and social habits of the people. The children of this once hermit nation have, in most lines of endeavor, a way wholly their own of solving problems which we have wrought out or are trying to work out by their methods. One subject that specially interested me was their decorative art, of which I have not time to speak this evening.

I made the following journeys while in Japan :

1. An extensive and minute tour through the province of Echizen, visiting almost every town and village of importance.
2. A summer trip through Kaga (the province of "red and gold" porcelain, made at Kutani), during which I ascended Hakuzan, probably the second highest mountain in Japan. I was the first foreigner to ascend it.
3. A winter tramp across the whole breadth of the island, through the provinces of Echizen, Omi, Owari, Mikawa, Tōtōmi, Suruga, Sagami and Musashi, to Tōkiō, a distance of over 300 miles through mountain, lowland and sea scenery.
4. A detailed trip through Kadzusa, Awa and Shimōsa.
5. A journey through Shimōsa, Hitachi, Shimotsuké to Nikkō, and return to Tōkiō by water.

* See Reports of Horace Capron and his Assistants, Tokio, 1873.

6. A journey overland *via* the Tōkaidō, from Tōkiō to Kiōto ; thence north through Wakasa, Echizen, Kaga, Etchū and Echigo, along the shores of the Sea of Japan ; thence over the highlands of Shinano and Kōdzuké to Tōkiō.

7. Four journeys from Tōkiō to Shidzuoka, and through the Hakoné mountains.

As I have already written so much concerning Japan and the Japanese, I shall not here repeat in detail the facts concerning their geography, history and social life, which are accessible to you all.* I shall conclude this paper by attempting to answer two questions which are likely to arise in your minds.

1st. What is the present condition of affairs in Japan ? Is real progress still the rule ?

2d. What are our national relations with Japan ?

I answer the first question by a rapid survey of the whole field of affairs. First, as to the subject on which men change most slowly—religion. Whereas Japan was, for over two centuries, a shaking of the head to Christian nations, and a proverb and precedent to the historian of persecution, she has, since 1873, withdrawn her published edicts against Christianity, and to the Protestant, Roman and Greek forms of that faith, the country is practically and equally as open as to foreign trade and commerce. There are now fifteen organized Protestant Christian Churches, with a membership of nearly as many hundreds, and a following of many thousands in Japan. Russian missionaries have at least three churches, and a following of probably five thousand souls. French missionaries report a following of over twelve thousand persons, with several handsome church buildings. Surely these simple facts speak eloquently of real progress in the domain of religious liberty, not to mention the vast influences created by the translation of the Bible, which is "like building a railway through the national intellect." The schools, colleges, hospitals, dispensaries, Christian literature and Romanization of the language, established and carried on by the ladies and gentlemen who make up a noble army of laborers from four countries. In the work of national education, elementary and special, first-class private schools maintain a healthful rivalry with

* All the books, maps and pamphlets referred to in this paper are to be found in the Society's Library.

those established by Government. Some of the rather numerous "Schools of Foreign Language" have recently, from motives of economy, been abolished, but the work of vernacular education goes grandly on, and over 1,900,000 children attend the public day-schools all over the country, which are taught after the general method of American schools, with modern equipments. Special schools, rather colleges, under the Departments of War, Navy, Public Works, Justice, and Bureaus of Agriculture and Colonization, largely attended, thoroughly equip young men for their special professions. The Japanese training-ship *Tsukuba Kan*, recently set sail for a cruise to Australia and New Zealand, with a crew of young men—future naval officers of Japan. She is commanded by my old friend and pupil, Capt. Junzo Matsumura, his schoolmates (at New Brunswick, N. J.) being H. I. J. M. Minister Plenipotentiary at Washington, Yoshida Kiyonari; the late Hatakéyama Yoshinari, President of the Imperial University of Tōkiō (having with its attached Language School, twenty-five foreign professors, and about six hundred students); and Samro Takaki, now Japanese consul at New York. Here let me add, that out of several score of Japanese youths educated in this country, by far the larger majority of those living are now in government positions of rank, honor and profit, while some are private teachers, merchants or ministers of the gospel, helping forward the work of progress. It would be too much of human nature to expect that so much new wine in old bottles should not occasionally rend a skin or burst out an untimely cork, and the natural vanity of the Japanese overflow offensively; but with a very few glaring exceptions, the "returned students" have been earnest, faithful, patient and industrious, with heart and eye forward and not backward. I cannot recall a single case of one who has become utterly vicious or degenerate. In a number of cheering instances I have been able to trace political reforms accomplished and social abuses corrected to the persistent, though invisible influence of some returned student. To the Japanese themselves must be given the credit of most of the wondrous works of moral, legal, social and educational reform recently attempted or completed, but in many cases the "power behind the throne" was, as I know, some returned teacher or student, who had the imperial or prime-ministerial ear—ears ever open to earnest patriots. It is but fair to state this, since the "returned

student " has been the target of not a little unjust criticism from the pens of the Anglo-Japanese newspapers.

In spite of the recent drain on the resources of her treasury, in putting down the Satsuma rebellion, Japan is carrying forward many costly public works. There are now two railways in operation, one from Yokohama to Tōkiō, the other from Hiōgo to Kiōto. Telegraph lines connect Hakodaté with Nagasaki, the Dan and Beershaba of Japan. The mineral resources are being developed, not as they ought to be, but on a larger scale, and with better methods than before; while it may truly be said that never before was more attention paid to the soil and husbandry of the country. The coasts are now lighted by 34 light-houses, 3 light-ships, 16 buoys, and 5 beacons (Off. Report, 1877). Japanese steamers ply between the seaports of Japan and to China, Corea, the Riu Kiu Islands, and even make an occasional trip to England. The most remarkable evidence of real progress, and a good index of the literary, social and commercial character of the people, is furnished by the Postmaster-General's Report for 1877:

Letters, ordinary (mailed).....	22,053,430
" registered	606,354
Postal Cards.....	6,764,272
Newspapers	7,372,536
Books, patterns, &c.....	322,642
Free communications.....	856,637
Letters despatched to foreign countries.....	140,631

The following paragraph will show the estate and growing power of the press in Japan :

The number of domestic newspapers transmitted in the mails during 1877 (7,372,556) is an increase of 2,323,141, being 46 per cent. over the number transmitted in 1876, and 100.4 per cent. over the number mailed in 1875.

There are now 3,744 post-offices, 151 receiving agencies, 916 stamp agencies, and 866 street letter-boxes in use and operation. Japan became a member of the General Postal Union, and her stamps are now recognized as valid payment of postage to other countries of the Union. Postal agents and regular mails to Fusan, Corea, and in seven ports of China, facilitate the intercourse between residents

or natives of these three countries. The system of postal money orders and postal savings banks has been also in successful operation for several years. Mr. Samuel Bryan, an American citizen, formerly of the Post Office in Washington, is the efficient foreign superintendent of the Japanese Postal Bureau, under the auspices of which also a Mercantile Marine Training School, and a Marine Board for the examination and issue of certificates to masters, mates and engineers, both native and foreign.

To summarize: Japan, though no longer astonishing the world by brilliant surprises, still pursues the path of progress and development, both at home and abroad. As she was one of the first to be at Philadelphia, so is she one of the first at Paris, at the Congress of Nations.

2d. What are our national relations with Japan? I answer, not what they ought to be. To say nothing of the unjust "Shimonoséki indemnity" or extortion-money, now amounting to nearly \$1,500,000, lying idle in Washington, and which ought to be returned, our existing relations are on a basis which is exceedingly generous to England, somewhat so to ourselves, and decidedly unjust to Japan. In looking over the history of our diplomatic relations, I regret to say that the policy inaugurated by Townsend Harris, of giving fair play even to a weak nation, and taking no unfair advantage of a people ignorant of the laws of political economy and the customs of modern commercial nations, was not followed by his successors. In 1866, a "tariff convention" was made in Japan by the foreign diplomats, which unfortunately was signed on behalf of the United States not by a Minister, but by a *Chargé*—a Hollander by birth, training, and *Déshima* traditions—Mr. Portman. In this treaty Japan, then utterly ignorant of the position in which she placed herself by the act, bound herself to impose a tax of *five per cent. upon all exports and imports*, whether *ad valorem* or specific. This treaty bound Japan not to take any steps to revise it, so that the initiative of revision must be taken by the other contracting powers—England, France, Holland and the United States. Japan cannot alter it in the slightest degree. Now, since 1868, with the exception of one year, the balance of trade has been against Japan, thus sorely crippling her in her earnest endeavors to compete with other nations. When we study this matter in the light of justice and our own Constitution, which strictly forbids export duties, we find that Japan is, with

injury and injustice to herself, obliged to impose a duty of five per cent. on all exports. Further, since 1866 the value of most articles of luxury and use imported into Japan have greatly increased in value, and the duty being originally fixed upon the weight or measure of these, the Japanese revenue is in reality defrauded by this treaty of a large income. It is a clear injustice to compel Japan to abide by a treaty made in her political nonage, and which she is now powerless to change. Let a few figures show how much England is interested in keeping the present treaty in force, and what a slight difference it will make to the United States to change it :

1876.

Arrival of English vessels in Japan.....	218
“ American “ “	124
Imports from English possessions.....	\$14,894,328
“ United States	1,811,083
Exports to English possessions.....	3,917,372
“ United States	6,887,307
Total exports and imports	\$43,820,953
Exports and imports for English possessions.....	18,811,500
“ “ United States	8,698,390
Imports, excess over exports.....	7,665,275

1877.

Arrival of English vessels in Japan	243
“ American “ “	84
Imports from English possessions.....	\$15,082,466
“ United States	1,239,252
Exports to English possessions.....	9,383,866
“ United States.....	5,441,367
Total exports and imports.....	\$52,625,355
Exports and imports for English possessions	24,465,332
“ “ United States.....	6,680,619

England sells all she can, and purchases as little as possible. She is interested in keeping the treaties as they are. The United States is not. Even if she were, it is neither justice nor friendship to Japan, and an utter repudiation of her earlier diplomatic policy, to uphold her present treaty when Japan wishes it changed. In the negotiations now pending at Washington, it is to be hoped that our government will proceed on an independent basis of justice, and allow Japan to regulate her own commerce. It is no question of "protection" or "free trade" which is here raised. It is the simple right of a nation to control her own trade, without foreign intermeddling. Should the United States revise the treaty on the basis pleaded for in this paper, several new ports will at once be opened to American commerce. In fact, the entire country of Japan would be at once thrown open to foreign trade, commerce, residence, missionary labor, &c., if that peculiar arrangement "extra-territoriality jurisdiction" were abolished. There is no other way in which the United States may prove her friendship to Japan, and more surely help forward her progress, than by a speedy revision of the existing treaties on the basis of right and justice.

THE SO-CALLED CELTIC MONUMENTS OF BRITTANY, FRANCE.

BY

W. WRIGHT HAWKES, LL.D.

The labors of the Society over which you preside, and to whose usefulness, and therefore success, you have for many years devoted your enlightened efforts, have a two-fold bearing. They not only increase our familiarity with the surface of the globe by promoting the exploration of regions hitherto but little trodden, by the discovery of new routes of communication, or by the laying bare old ones, hidden perhaps under the dust of ages ; but they practically enlarge the public domain of knowledge, by attracting attention to numberless facts and phenomena which, while they are within the province of special science, geography also, by its many-sided phases, embraces. It is this large and manifold sphere of activity of this body, and, I may add, the untiring conscientiousness with which its executive members do their work, that have not only earned for the American Geographical Society its prominent position on this continent, but have made it the peer of older societies of a similar nature in Europe, and their worthy co-laborer in the great intellectual workshop of the world. In making these preliminary remarks, Mr. President, I would not be understood as aiming chiefly at the laudation of this society. It needs not my praise. I make these observations rather as a justification, ladies and gentlemen, for calling your attention this evening to a subject which unquestionably lies within the scope of geographical studies, but which presents also some aspects of a strictly archæological nature. But I beg of you not to be alarmed at this term, archæological. I shall not attempt to lead you far into the misty intricacies of the science of archæology. And as a proof of the sincerity of this statement, I here propose an agreement between us, in our mutual interest. In order

that you may the better understand the objects to which I shall call your attention, I intend to illustrate them by stereoscopic views, as I proceed, instead of massing these at the end of my lecture. If, therefore, you will grant me your indulgence for these interruptions and any consequent want of connection in my remarks, I, on my part, will endeavor, in my treatment of the matter, to divest it of those dry technical terms which are better adapted to the student's closet than to the public lecture-room.

Mr. Bryant, in his touching and yet humorous response to the well-merited tribute to his character and ability paid last autumn by the Goethe Club, adopted this definition of man: "an animal delighting in antiquities." As is the case with all Mr. Bryant's remarks when he condescends to humor, the wit of this definition only brings out the more vividly the great underlying truth. The definition is a good one, for it involves the importance of the first of the two great questions so often asked: "Whence do we come? Whither are we going?" Science tries to answer the one—speculation the other. The two are, however, intimately connected; for all nations and races show, even in their latest development, traces of the vices and excellencies of their origin. It is in illustration of the first question that archæology, by revealing former customs, becomes the assistant of geography; and so striking are the results which these two sciences have attained within the last few years, that we are at times led almost to believe that we are getting close to the inner secret chamber in the temple of science, where the last great mysteries that surround man's history are to be revealed. But there will, doubtless, always be another inner chamber to be opened. It is this thought which, in one sense, has been so beautifully illustrated by M. Guizot in his *History of Civilization*. "In no one thing," says that elegant writer, though unfortunate statesman—"in no one thing has it, perhaps, been given to man to reach the goal; his glory consists in marching *towards* it." Still, this seeming approach to the great solution of our inquiries gives fresh vigor to research. It induces accuracy. As we seem to draw nearer and nearer to our object, we examine with more critical eye. Every theory is tested; every material element, every stone, every particle of dust connected with our discoveries is more closely scrutinized. The recollection of former, but now dispelled, illusions, puts us on our guard lest we indulge in fresh ones, or take as an authentic record of some

great event or race some such inscription as that on the stone so humorously described by Dickens as having been presented to the Pickwick Club. This fear is indeed now carried so far that the tendency is rather to excessive skepticism than to credulity as to the value of many of our discoveries. But we cannot wonder at this, for many are the monuments and ruins in various parts of the world that still baffle the investigations of the most acute observer. Among such ruins or monuments are some which I wish to make the subject of my remarks this evening. I allude to what are generally but somewhat vaguely termed the "Celtic remains" of the west coast of France. These remains form part only of the vast chain of such objects, many a link of which is broken, but which, taken in the whole, stretches from the base of Mount Atlas, in Africa, northward along the coasts of Portugal, Spain, France, Germany, Scandinavia and the British Isles, and as far northward as Iceland. Indeed, the traces of such objects are found even in Asia. We cannot decide with certainty as to the age of their erection. Yet we are not without some data which, as I shall hereafter show, enable us to form an opinion as to the general period to which they owe their origin. I will now simply say that they probably belong to what are usually called the pre-historic ages—ages which, like childhood's wonderland, appeal strongly to imagination and curiosity—ages surrounded by mists into which science is daily flashing its light further and further, causing their limits to recede. But until those mists shall be more dissipated, it would be presumption to decide upon the exact period of the erection of these monuments. Hence, in proportion to the interest they excite must be our caution in pronouncing. I have said that these ruins are not confined to France; but it is in a certain part of that country, and in a comparatively limited region, that they are found in the greatest number, in the best state of preservation, and of the most colossal proportions. Hence my remarks must be taken as bearing chiefly upon that region.

In that part of France which is on the southern side of the large peninsula of Brittany, and in a northeasterly direction from us, distant only some eight or ten days by steam, and between the parallels of the forty-seventh and forty-eighth degrees north latitude, and between the fourth and the sixth degrees of longitude west from Paris, is the department of the country known as the "*Morbihan*." In that department, on the Atlantic, is the gulf or great bay of this

name, which applies to the whole department. This word Morbihan, in the Breton language, signifies "*small sea*," and is composed of three syllables, "mor," sea, and "bihan," small. As I have observed, this department forms part of the old province of Brittany, which, after years of semi-independence and of hostility to the French kings, became finally united to France in 1491 (one year before the advent of Columbus to our shores), by the marriage of Anne, Duchess of Brittany, to Charles VIII., son of Louis XI., so graphically described by Sir Walter Scott in his novel of "Quentin Durward." After the death of Charles VIII., who died in consequence of having carelessly run his head against a nail in the Castle of Amboise, near Tours, the union between Brittany and France was still further cemented by a second marriage between Anne and the Duke of Orleans, who became king of France under the title of Louis XII., and whose equestrian statue is seen over the portal of the Castle of Blois, about two hours from Tours. Having thus alluded to the old province of Brittany, in which lies this great bay of Morbihan, along the shores of which are these remarkable remains, we will refer to the bay itself.

This bay of Morbihan covers about 40,000 square acres, and is studded with islands, said to be over 300 in number. Many of these are little else than rocks projecting above the water, while others, like the Islands of Arzon, and the Isle des Moines (the Island of Monks), are of considerable extent, having villages on them inhabited by mariners. These are among the best sailors in the world, and their ancestors have from time immemorial borne that reputation. Indeed, it is now more and more widely believed among scientists that the early inhabitants of that region probably visited this continent anterior to the supposed visit of the Norsemen. The north shores of this great bay are exceedingly beautiful, being studded with private residences and chateaus, surrounded by parks and well cultivated fields. The other shores are rugged and bleak. Long sand-beaches and immense rocks give a weird and exceedingly striking aspect to the whole of the sea-shore. Indeed, as many of you are aware, there are few shores surpassing those of Brittany in the grandeur of their scenery. Several large rivers, the chief of which is the Auray, empty into the bay. On one of them lies the city of Vannes, the capital of the department of the Morbihan. It is a few miles distant from the bay itself. It is a

quaint old Breton city of some 14,000 inhabitants. It is full of historical remains of different periods—Celtic, Roman, and mediæval. It is supposed by some that this was the ancient Darri-origum of the Romans, while others, I believe with more reason, place that Celtic stronghold on the tongue of land, or, as we should say, “peninsula” of Lockmariaker—in the Breton language, “Place of Mary the Virgin.” Vannes was unquestionably a settlement of the Celtic tribe of the Veneti at the time of the Roman conquest, and, as you perceive, it retains in its sound traces of the name “Veneti.” It was on the islands of this bay and along its shores that this tribe of the Veneti dwelt. Indeed, it is now pretty well settled by history that it was on this bay of Morbihan that the great decisive naval engagement took place between Cæsar and the Celts, which ended in the destruction of Celtic independence, and led to the putting to death, by that stern conqueror, of the whole Senate or Council of the Celts. Many of you doubtless recall the interesting account given by Cæsar in his Commentaries of his victory over these Veneti. This tribe living around the shores of the Morbihan, and whose country lay some miles inland, were, as I said, expert sailors for the period. Their vessels were impelled by sails, made chiefly of skins sewed together. They could thus easily escape from, or run down the Roman galleys, propelled by oars. Cæsar had caused his fleet to be built to the south, near the mouth of the River Loire, about where St. Nazaire now stands, whence the present line of French steamers start for the West Indies and the Spanish Main. In order to deprive the Celtic vessels of the speed gained by their sails, Cæsar directed large scythes or knives to be fitted to long poles, and with these implements the Romans severed the ropes of skin by which the sails were secured to the masts, thus keeping the galleys at close quarters to the Celtic ships. Indeed, tradition—generally an exaggerated, but seldom a totally false echo from the past—still points to a large tumulus near the entrance to the Bay of Morbihan, as the spot where Cæsar stood watching the result of that severe and decisive sea fight. Indeed, this whole region is replete with interesting historical associations; for only five miles from this tumulus stands the old Monastery of St. Gildas de Rhuys, where some twelve centuries afterward the celebrated Abélard, known for his philosophy and his love for Heloïse, took refuge from his persecutors.

I have gone into this description of the locality of this naval engagement, because, according to most archæologists, the monuments I am about to describe were probably erected by ancestors of the men who thus resisted the Roman encroachments in the northwestern part of Gaul. As I have said, the actual date of the erection of these monuments is not yet ascertained. Indeed it is probable that to Cæsar and his army, that date was as great a mystery as to us, and probably a greater one, for in Cæsar's time the Romans were more engaged in making history than in studying it, and I am not aware that there then existed in Rome any extensive archæological museums. Be this as it may, we have evidence that the Romans, finding these monuments ready made to their hands, used some of them as places of deposit for their dead. These traces of Roman customs and civilization are easily distinguished from those connected with a time long anterior, coeval in all probability with the creation of these monuments. This circumstance gives great interest to the locality, for while in many cities and regions different strata of civilization, so to speak, present themselves, there are few places where, within such a narrow circuit, is to be found such a mass of prehistoric remains lying under the supervening ones of a more recent date. The area thus marked by prehistoric ruins of startling magnitude does not exceed, on the average, twenty-five miles of extent east and west, by a width of some ten or fifteen miles inland, taking the great Bay of Morbihan as the central point on the Atlantic. But it is on or near the shores themselves of this great bay that are found the most striking of these colossal monuments of a period long antedating all written records, or, I may say, traditions. But however much we may admire the evidences of the energy and achievements of those cultured, sagacious, iron-nerved butchers, the Romans, it is still these prehistoric remains and the mystery that in part shrouds them that give to this region its peculiar character. In moving among these old and still illegible milestones of ages, which, if their sculptures could only be deciphered, would show us in part the old road humanity has trodden, the traveler realizes the state of mind of Macaulay's hypothetical New Zealander, who is to stand some day on the ruins of London Bridge and wonder what kind of people built it.

Before describing these ruins in their separate character, or,

as we frequently find them, grouped together, though sometimes in a dilapidated condition, I may state that it is only since the beginning of the eighteenth century that these remains of a remote antiquity have been the subject of serious scientific inquiry. Even the Benedictine Monks, who at that period collected with so much care all the elements of the history of Brittany, make only a passing allusion to these ruins, which may be found in the work of Father Bernard, of Monfaucon, entitled, "Antiquity Explained and Illustrated by Figures," published in Paris in 1719. Since the beginning of our own century, however, these monuments have been closely investigated by some of the leading archaeologists—among whom I would cite Professor Worsae, of Denmark; Ferguson, of Dublin (to whom was committed the decoration of the Hall of Nineveh at the Sydenham Palace); Dr. Simpson, of Scotland; Baron Bonestetten, of Switzerland; Renégalles, Closmadeuc and Fouquet, of Vannes; Prosper Merrimée; the great historian of France, Henri Martin; Bertrand, of the Museum of St. Germain, and Mr. Miln. German scientists have also written upon the subject. The admirable Celtic collection of the Polymathic Society of Vannes, and the private collection of the Count De Limur, of the same city, give evidence of the industry and care with which investigations of these remains are now pushed. The publications of this Polymathic Society of Vannes bring periodically to public knowledge every step gained on the line of accurate scientific inquiry. Indeed, so much attention is now directed to these objects, that they are visited by parties of scientific men annually from various parts of the world, and one gentleman from this country has taken up his residence in their neighborhood in order to pursue his archaeological studies.

These interesting monuments were at first termed *Druidical*, for imagination attributed to the most remarkable of them the character of Druidical altars. The sober reasoning of subsequent archaeologists has deprived many of them of that character, and the whole of them may now be conveniently arranged in five classes: First, the "MENHIRS"; second, the "PEULHENS"; third, the "DOLMENS"; fourth, the "TUMULI"; fifth, the "DRUIDICAL" altars. There is another appellation bestowed upon some of them, namely the "Cromlech"; but, strictly speaking, this term should apply rather to the form or position in which some of these ruins or monu-

ments are found than to the distinct nature of the objects themselves. The names of these monuments are of comparatively modern creation—not later than the sixteenth century. The English archæologists generally use the word “cromlech” to designate the “dolmens”; but “cromlech” signifies only a round place of stones. We will now consider the five classes I have mentioned, and we will take them up separately. Let me observe that any number of these objects grouped together form what is termed a “Celtic monument,” as we would use the expression to indicate a collection of columns or erections surrounding some main building, yet to be taken with it as a whole.

THE “MENHIRS.”

The word “menhir” signifies in the language of the country “high or long stone,” from the syllables “*men*,” stone, and “*hir*,” high. In Saxon these stones, when found arranged in order, were called “stonehenge.” The menhir is a large, raised stone, and always a monolith or stone of one piece. These menhirs are uncut, but not entirely rough. Their surface bears no mark of hammer, chisel or any other implements, and yet they are rounded, without corners or sharp angles, except such irregularities as are evidently the work of time. Some are of great size. The largest I have seen, and which is, I believe, the largest found, is about sixty-five feet in length by some twenty-four feet in circumference at its thickest part. This menhir is worthy of being considered separately, and we will therefore first consider the most imposing group, of lesser but yet enormous ones, as we find them near the village of Koernec or Carnac. This village, containing about 4,000 inhabitants, is situated about three miles from the shores of the bay to the northwest of the peninsula of Lockmariaker, to which I have called your attention. Traces of these stones are found running down close to the bay, but it is only about a mile from the village of Carnac that they present themselves in large groups, running from the southwest to the northeast. Some of them are from six to twenty feet high. Many have been broken off at their summits. They are set in the ground at distances varying from twelve to twenty-four feet, and so placed as to form, apparently, streets or alleys, varying in width from fifteen to forty feet. Roads have been laid out, and in one place a small village has grown up among

them, destroying of course the symmetrical arrangement of the stones. Utilitarianism, I am sorry to say, has also laid its heavy hand upon them, and the peasants have broken up many to obtain materials for their houses and fences. General Pommereul, who was the Military Examiner of the first Napoleon when he entered the army, states that in his day—say about 1780—these menhirs still covered a space about 8,000 feet in length by about 300 in width, and were in number about 4,000. A more recent plan and estimate, made by a Government engineer, shows the lamentable fact that in 1844 the number of these Carnac menhirs had been reduced to about 2,000. The work of destruction, I fear, has not ceased, but the Government, while protecting, as it zealously does in France, the rights of private property, is doing what it can to stop the destruction of these stones. These menhirs of Carnac, even in their mutilated forms, can easily now be traced over an extent of fifty acres; and it is evident that they formerly extended several miles in various directions, these groups being now distinguished by the names of the different localities or villages near them. The great group of Carnac is still the most imposing.

Sir Walter Scott, alluding to his favorite ruin of Melrose, says:

"He that would see fair Melrose aright
Must visit it by the pale moonlight."

So I would say to those that visit the menhirs of Carnac. As the moon falls in fitful rays upon these huge stones, fancy can people the rows of these "megaliths" with the forms of some gigantic race long since passed away. Time and the elements, and, still more, the hand of man, have altered somewhat the shape of these stones, but their size and their base sufficiently indicate their probable original immense volume. But in order that you may better form an idea of their size, we will now look at one of those Carnac stones, which stands somewhat apart from its companions, though doubtless originally near them. It bears, as you see, in its fissures deep marks of Time's ravages. By the most correct measurement which I could make, it is about 16 feet high by 12 feet around at the bottom, and it is believed that its depth in the ground is about 10 or 12 feet. I now call your attention to the largest menhir known. It has fallen down and lies in four parts, which, however, at the points where they are broken off, correspond as accurately as if moulded

into each other. In weight the stone is estimated at 400,000 to 500,000 pounds. It is of grey granite, like all the rocks of this region. It is smooth on the surface and rounded with tolerable uniformity, yet bears no mark of any implement. It is conical in shape, and a deep depression in the soil near its smaller end, induces the belief that it was inserted in the ground at this smaller end. This menhir, when erect, must have presented somewhat the appearance of an inverted cone. The total length of the menhir is about 65 feet, and it is about 24 feet around at the largest part. This menhir is not at Carnac, but on the peninsula of Lockmariaker, which contains, besides menhirs, perhaps the greatest number of dolmens, "Tumuli," within a comparatively limited space. This peninsula is only a short distance from Carnac, and is a great resort of scientific men on account of the variety of remains it possesses. It is indeed as worthy of a visit as Carnac itself. Before alluding to the supposed object of the erection of these menhirs at Carnac and elsewhere, let me say that there is another exceedingly striking menhir in an adjoining department, namely, that of Finistere. Indeed the largest menhir still erect, but isolated, is found in this department, in which the city of Brest is situated. But the one to which I now allude is near the town of Concarneau, one of the most important stations in France for the sardine fishery. This menhir is near a small village called Trégunc, about an hour's drive from Concarneau. It stands in a wild region, where large granite boulders are scattered around. The material of this menhir is granite, containing a large amount of quartz. Its height is about 30 feet above ground and some 14 feet around. On the top is a large stone cross, but the memory of man runneth not to the time when that rough granite cross was placed there. It guards the old Pagan monument, however, by throwing around it the protection of Christianity, and evinces the same beautiful spirit which has led the descendants of the old Celts of Ireland also to place under the shadow of the symbol of our faith the Pagan monuments due to the old Druidical system, or possibly to an earlier one, when man was blindly groping, but still groping after his God. The greatest historian of France, Henri Martin, has well described those Irish monuments in his volume of Notes published in 1875. There is one important fact, however, connected with the Carnac menhirs which has some bearing upon the vexed question of the object of their erection.

It distinguishes, indeed, the Carnac menhirs from others. In the numerous excavations that have been made around certain menhirs elsewhere, signs of inhumation or burial and traces of burnt sacrifices, of human bones and of those of animals, crumbling now to the touch, have been discovered, at a great depth, close to the lower part of the raised stones ; but in no well authenticated case have such signs or traces of burials been found around or even near these Carnac menhirs, except such as are of comparatively recent and probably Roman origin, as shown by the pottery and other objects now familiar to all archæologists. Indeed, as I have said, this whole region is full of Roman remains, such as pottery, bricks, and even of causeways. In reference to their position, these huge stones of Carnac evidently start from a common centre. Their alleys or streets branch off like radii, till at an immense distance, their fragments diminishing more and more, all traces of them are lost. But this absence of all signs connecting these Carnac stones with funeral rites, and the daily increasing insight into Pagan systems of belief have brought many of the best archæologists to the conclusion that the Carnac menhirs form a vast monument or temple, so to speak, of a religious character. This view is strengthened by two facts—first, that the central point whence these radii seem to proceed, indicates a vast cromlech or circular disposition of stones, and is supposed to have reference to the worship of the serpent, which, in its rounded form, as we know, was the emblem of eternity ; secondly, the frequent reproduction of the figure of the serpent on the walls and roofs of the dolmens, as you will see in the sculptures I am about to show you. It was once supposed by Cambry, the first President of the French Celtic Academy, and by others of his school, about the beginning of this century, that some astronomical object or reference presided at the erection of the monuments ; but this view is now generally abandoned by serious archæologists. There are, however, one or two circumstances, which we may call singular coincidences, which formerly gave rise to the astronomical theory, such as the position of a certain rocking stone pointing to the rising sun, but which stone, it is now admitted, owes its vacillations on its pivot to the action of the elements. Several such large blocks, however, are found in different parts of Brittany. I remember having seen one on the road to the menhir of Tregunc, which I mentioned. That

stone must weigh at least 150 tons, and yet a village child, ten years old, easily sets it in motion on its partially hidden pivot, evidently worn away by water.

If doubt, however, rests upon the real object of the erection of the Carnac menhirs, whether they are the remains of huge dwellings, or of temples shaped according to the religious conceptions of an age and race whose mysteries of faith we can neither solve nor indeed fully state, more light rests upon the question of the race to which these remains owe their origin. This question, however, I shall reserve for the close of this lecture, in order not to interrupt the consideration of the different objects in the five classes I have mentioned.

THE "PEULHVENS."

A few words with reference to them will suffice. The term "peulhven," composed in the Breton language of the syllable *peulh*, column, and *men* (in contraction *ven*), stone—namely, a narrow, straight column or pillar. These pillars have much less bulk than the menhirs, and are generally found alone, not in rows. In some cases they are evidently fashioned by the hand of man. I have seen some with one side quite smooth, and showing angles at the edges. The want of evidence connecting them with funeral rites, and the absence of human remains near them, have led archæologists to regard these peulhvens as merely commemorative monuments, erected to recall some distinguished man or striking event in the history of the race that erected them, the record of which is lost in the mists of time. Until those mists shall be pierced by the light of science, speculation alone can flash its uncertain rays around the origin and objects of those peulhvens. Perhaps we may attribute their origin and object to a custom common to all races, and continued down to our days, of erecting stone pillars to commemorate remarkable occurrences, a custom doubtless existing long anterior to the time when the crafty Jacob, flying before the wrath of his impetuous brother, and, perhaps, before the goadings of his own conscience, erected at Bethel a stone pillar—perhaps a peulhven—in commemoration of his strange vision or dream. But the obscurity which covers the origin of these Celtic peulhvens does not exist to the same extent in reference to the dolmens.

THE "DOLMENS."

This word "dolmen" (a corruption of the Breton word *taul*, a table, and *men*, a stone—a table-stone) is the appellation given in the country to the most interesting of all these prehistoric remains. These dolmens are exceedingly numerous around the Bay of Morbihan. Over two hundred in the department of the Morbihan have been exposed, and it is believed that others exist. They were unquestionably burial chambers—probably of chiefs or distinguished persons. In them are often found human bones, and frequently stone objects, such as axes, beside necklaces of valuable precious stones. In the museum of the Polymathic Society of Vannes, there is a cast of one of these skeletons, but whether of a Roman, deposited in the ready-made chamber, or of a Celt, cannot yet be determined. At the entrance of these dolmens have frequently been found the burned remains of the bones of animals, leading to the belief that before the dolmens were closed burial sacrifices were offered to the manes of those interred within. The monuments have different names, according to the countries in which they are found. In France they are called "dolmens;" in England, "cromlechs;" in Germany (owing to an erroneous idea as to their origin), "Hünengräber," or "Graves of the Huns;" in Scandinavia, "Jattestuer;" in Portugal, "Antas;" in Spain, "Cuevas de Minga," or "dolmins;" in Greece, "Taphos"; in Africa, "el R'Oul."

The country people of Brittany often term them "fairy grottoes," as in the case of the three large dolmens at the village of Plou-Harnel, near Carnac. Until the close of the sixteenth century they were in fact called cromlechs in France, which word the English still retain. But in the eighteenth century the founders of the Celtic Academy of France gave the name of dolmens to them, and this name is now generally used in that country. These monuments were formerly, but improperly, regarded as Druidical altars, used for human sacrifice. Found in the region where the Druids held sway, imagination, seizing upon the most striking and awful ceremonies of the Celtic priests, was naturally inclined to find in these remarkable remains of a remote age evidence of the frequency of the most objectionable features of the Druidical worship; but serious research has reduced such views to their proper value, and washed from these dolmens the blood-stains which heated fancy had connected with them. Indeed, so much light has of late years been

shed over Druidical priests and their theology that such errors are no longer possible. We may regard the celebrated memoir read by Duclos before the French Academy of Inscriptions in the last century—in 1746—as opening wide the gates to the flood of light which has since poured in upon the theology, customs, and underlying thought of the whole system of the Druids. Doubtless many a dark corner of that system is yet to be lighted up, but we know enough of it to discard much of the fabulous element hitherto attaching to it. This much has been acquired by science in relation to the old Druidical faith—the two great underlying ideas which formed the groundwork of the whole system in its uncorrupted state were, the belief in the unity of God, and in the immortality of the soul, which they thought was to pass from sphere to sphere in the gradual work of its perfection. In this positive belief it had an immense advantage over many Pagan systems. Indeed, Henry Heine, the erratic poet who gave much attention to Celtic studies, said, in his usual ironical manner, that among the Celts the belief in the immortality of the soul was so firm that he was of opinion that, if a Celtic debtor promised to pay in the next world, the period for liquidation would be considered by the creditor as quite satisfactory.

I fear that in our Christian communities the same view would not be taken by our banks and corporations; but then it is generally supposed that those bodies have no souls, and therefore not interested in the question of immortality.

These dolmens are chambers constructed of large slabs of stone placed vertically, the smooth side always turned inwards. Upon these vertical stones rest as a covering immense flat ones, sometimes of enormous size—hence the term *tauls* or table-stones given to them. The entrance to these chambers of dolmens is usually a corridor or gallery, generally narrower than the dolmen itself and formed of smaller vertical stones, covered also by flat ones. Frequently these galleries are preceded by circles of erect stones or menhirs. The circles are properly the *cromlechs*. The height of these galleries leading into the dolmens varies from five to nine feet on an average, and the width is sometimes not more than four and a half feet. The lengths of the galleries differ. In some the gallery is not more than six feet; in others it is much longer; while in many it is impossible to measure the original length, owing to the

partial destruction of the vertical stones forming it. The sides of some of these galleries are perfectly plain, and others are covered with rudely sculptured figures or forms, evidently showing a dominant thought on the part of the authors, although, so far, the deciphering of these forms and characters has completely baffled investigation. The largest dolmen in a fine state of preservation which France perhaps possesses is the Great Dolmen of Bagneux, near Saumur, in the valley of the Loire, where the large cavalry school of the French army exists. The gallery leading to this dolmen has been almost entirely destroyed, but the large chamber itself is in remarkable preservation. In size it is about twenty-three feet long, about nine feet high, and sixteen feet broad. Four enormous slabs laid horizontally form its covering or roof. I took an accurate measurement of one of these covering stones as a fair measurement of the others, and found it three feet thick, twenty-one feet long, and eighteen feet wide, and resting like the others upon vertical stones about nine feet high, forming the sides of the chamber. There are no sculptures or figures in this large dolmen of Bagneux, or of Saumur, as it is generally called.

It has been a mystery how these enormous slabs of stone were moved, and how they were raised to their present position. The first of these questions may now be considered as well-nigh solved. Professor Robert, of the Academy of Sciences, of Paris, read to that body, last year, a paper giving an account of some discoveries he had made in a partially dilapidated dolmen in the northeastern part of France. It seems that, around this dolmen, he discovered a number of large balls of stone which would appear to have been left on the ground after the completion of the monument—much in the same way as around the rear part of the Parthenon, at Athens, were found unfinished parts of columns of Pentelicon marble, intended probably by the architect for the construction of the temple, but not used. The stone balls found by Robert are believed to have been employed by the constructors of the dolmens to move these immense slabs from one place to another. In corroboration of this view, now generally adopted by scientists, Professor Robert states that a similar mode of moving the large rock on which stands the equestrian statue of Peter the Great at St. Petersburg was employed in comparatively modern times. A similar contrivance practically adopted every day in our streets in moving our large sidewalk slabs by

round wooden rollers, recalls the anecdote of setting the egg on its end by Columbus, and suggests, like all simple means, the natural reflection, "Any one might have thought of that." Why did scientists not think of it during centuries while wondering at the skill of those early constructors of the dolmens? How these large stones forming the roofs of the dolmens were raised to their present position is another question, to which as yet no satisfactory answer can be given. When its solution shall be known, we shall doubtless be equally surprised at the simplicity of the process.

The number of these dolmens in the department of the Morbihan is so great that time does not allow me here to do more than state that they all bear a general character, though marked by certain peculiarities. All these dolmens point to one object with reference to their origin. The human bones and stone adornments—some of jasper—induce the belief that they were stone chambers or vaults for the dead. One great difference between these dolmens, however, is the presence of certain sculptures inside some of them, and the total absence of such in others. The great dolmen of Bagneux which I have shown you is totally devoid of marks or sculptures, either on the exterior or interior, while the dolmen of the Isle of Gavrinis, or Isle of Goats, in the Bay of Morbihan, is literally covered with them. The peculiarities of these rude sculptures, which have thus far baffled the acuteness of the most skillful investigators, have rendered this dolmen a great point of attraction to the student of these singular remains. I will, therefore, direct your attention to this dolmen and give a particular description of them, to be followed by a stereoscopic view. This dolmen is covered by a clearly defined, circular tumulus, some 20 feet high and about 320 feet in circumference. This tumulus is composed entirely of small stones, lying loosely upon each other. They are, however, of tolerably uniform size, averaging from six to ten inches cube each, placed around the dolmen until the tumulus was formed. This tumulus would seem to have been originally much higher, inasmuch as the apex has been removed, leaving something of a plateau on the top. At the base of the tumulus, and on its northern part, is the entrance to the dolmen, leading down to which are steps of comparatively modern construction. The gallery from the end of these steps to the stone chamber is about 40 feet in length by 5 feet 8 inches or 6 feet in height, and about 4 feet in width. This gallery

is formed of vertical stones touching each other, but not connected in any way by cement or metal. The pavement in the gallery is of large flat stones, some of which are a few inches higher than the others. There are short steps at intervals of about two feet. This gallery leads up to a stone chamber nearly a third higher than the gallery itself. The sides of the gallery and of the chamber, as well as the roof, are covered with carvings which show, when taken as a whole, a certain unity of design, but considered separately, they disclose a marked difference from each other. These sculptures in most cases represent circles—some complete, others incomplete. It would take too much time were I to enumerate all the sculptures on the walls and the roofs of the different dolmens on the shores of the Bay of Morbihan. The views which I have given you illustrate their general character. They are found on several of the great dolmens of the peninsula of Lockmariaker, namely, on the one called the Manne Lud, or Mound of Ashes, and on the one in the same peninsula known as the Hillock of Cæsar, called Manne Groach, and also on the one near the great menhir which I have shown you as lying broken on the ground. The last-mentioned dolmen, from the size of its great covering-stone, is known as the table of the merchants or dealers who were wont, it is supposed, to gather around it. But as all these sculptures find their best representation and in the greatest number in the dolmen of Gavrinis, I shall confine my attention chiefly to that one. The sculptures of this dolmen will give you the best idea of the general character of the whole. The chief sculptures may be stated as of seven different classes or forms, all cut on the sides and roofs of the dolmen in question, some in relief, some sunk in the stone.

First, we have the figure called the "CUPALIFORM," the small cup-shaped figures, representing circular bowls or cups, sunk in the stone. They are three or four inches in circumference, and are generally arranged, as you see them, in groups.

Second, we have the figure known as the "PEDIFORM"—the shepherd's crook or curved stick. It bears some resemblance to one of the Hebrew letters. This figure is found not only in the dolmen of Gavrinis, but on many detached menhirs through the country. At Gavrinis it is produced in many singular combinations.

Third, we have the figure called the "JUGIFORM," because it somewhat resembles an ox's yoke.

Fourth, we have the "PECTINIFORM" figure, so called because it has somewhat the shape of a comb. This figure is often found on the large stones or *megaliths* of Scotland, according to Mr. John Stuart's statement in his work on the sculptured stones of that country.

Fifth, we have the "CELTIFORM" figure, so called because it resembles the stone ax, called by the scientists "*celtae*." This figure, as you see, is cuniform—in the shape of an ax or wedge. It is, perhaps, the only figure in these dolmens which represents a familiar object, unless we except the human feet, which are shown in one of these views. These stone axes are of different sizes—some nearly a foot in length. Some are of flint or other hard stone; some highly polished, like the one I have brought from the region I am describing, and which is deposited in our collection of interesting objects at the Society's building. For the authenticity of this one, which is now in possession of our Society, I would state that I owe it to the kindness of Mr. Pavot, and of another gentleman connected with the museum of the Polymathic Society of Vannes, of which the learned Dr. Cloismadeuc is President. These *celtae* or axes are represented in a variety of groups or combinations on the sides of the Gavrinis dolmen; and in one of the groups, where the edge of the ax seems turned upwards, are carved figures in relief, which are thought to represent serpents more or less erect. The worthy Abbe Cahours, who is probably a better theologian than an archæologist, and who has written a long description of these sculptures, has allowed his theological imagination to guide his pen in accounting for these serpentine figures. He finds in them a clear allusion to "original sin"! His sacerdotal character presupposes, of course, a total ignorance of the details connected with a lady's toilet, or he probably would have discovered in the "PECTINIFORM" or *comb-shaped* figure the original comb used by our common mother, Eve, in doing up her back hair!

Sixth, is the "SCUTIFORM" or *shield* shaped figure. It is one of the most striking sculptures in these dolmens. These figures represent shields or cartouches, with figures of cups or small circles inside of them, and from the top of these shields flames seem represented as proceeding.

Seventh, is the ax-formed figure, representing stone axes of dif-

ferent sizes, with and without handles, and sometimes the sharp point of the axe above the handle, like the point of a pick.

These classes embrace the chief figures sculptured on the dolmens.

THE "TUMULI."

Of these there are about thirty-five large ones in the Department of the Morbihan. Many of these differ from all those yet discovered of Africa, in the fact that the African tumuli, according to M. Rénan, have no dolmens. Some of these elevated mounds, such as the great tumulus of "Tumiach," not far from the shore of the Atlantic—a few miles from the Bay of Morbihan—are of great height. The one at Tumiach is visible a great distance at sea, and is about 90 feet high and about 500 feet in circumference.

The object of these tumuli is peculiar. The dolmens would seem to have been first erected, and around them have been placed immense quantities of stones, held together by mud of the bay, or a kind of marl almost impervious to water—thus keeping the mass of stones compact. This marl is thick and has become very hard. Over the primitive cement has been placed vegetable mould to a thickness of several feet; and upon this, in time, of course, grass and trees have grown. This conglomerate mass of stones and marl surrounding the dolmen is known by the term "gal-gal." This word is peculiar. It is Hebrew, and is formed by the repetition of the syllable "gal," signifying something circular. We find this term used in several places in the Hebrew text of the Old Testament.

THE DRUIDICAL ALTARS.

As I have said, the dolmens were once held to be Druidical altars; but the fact is now established that these dolmens, in whatever condition we now find them—whether partially buried in the earth, or entirely exposed like those of Corcorro and Bagueux, which I have shown you—were covered originally in primitive times by their separate tumuli. Hence they could not be used as altars for sacrifice unless the sacrifice were first made upon them before they were covered with the tumuli—a theory which there is not the slightest evidence to support. We know, however, now, that it was a rule among the Druids not to sacrifice upon altars of hewn stone. The stones used for those ceremonies were entirely

rough. Many such of great size have been found in the Morbihan, indicating by certain marks the object to which they were applied. Thus upon some of these stones grooves have been found leading from the centre of the slab down to other and deeper ones connected with round basins excavated in the stones, as if adapted to the reception of the blood of the victims. Such stones, now held to have been altars, are met with scattered about in this department. There is one of these stones in the very city of Vannes. As these grooves are on the top of the stones, it is difficult to obtain a horizontal view of the entire stone. But whatever there may be of truth or of mere imagination in the picture drawn by Cæsar in his Commentaries, as to the practice of the Druids enclosing their victims in large wicker frames and then burning them, we now know that the human victims offered in the mysterious rites of these Celtic priests were of three kinds—first, those who, through religious enthusiasm, offered themselves voluntarily as propitiatory sacrifices; second, those captured in war; third, the criminals whose execution for misdeeds took the form of a religious ceremony. If distance is said to lend enchantment to the view, it may often exaggerate the reprehensible features of many a religious system. So, doubtless, is it with reference to the charge brought against the Druids. Many—I may say most—of the pagan religions admitted human sacrifice. We find the proof of this in the old tradition of the sacrifice of Iphigenia, and even the old Hebrew faith is, perhaps, not exempt from a similar blot, if we admit the popular theory of the sacrifice of the beautiful daughter of Jephtha. It is, however, to the race vaguely termed Celts, and in tribes over which the Druids spiritually presided, that we chiefly attach this practice of offering human sacrifices; and it is to that race that these monuments and sculptures of grooved stones are believed to belong; but wide-reaching questions are involved in that opinion. Into these, in pursuance of my promise not to weary you with details, I will not enter to any great extent. A few words will suffice to indicate some of these questions. Do all these monuments owe their origin to the same race? Their general character unequivocally points to their erection by the same race. There will still remain, however, three great questions covering substantially the whole ground: What is that race? In what age, and why, were these monuments erected? I wish it were in my power,

without pretending to know more than is really known, to give a categorical answer to these questions. No one can now do so; and, in the language of oriental imagery, I can only say: "The pipe of surmise has not yet been smoked down to the ashes of certainty on these points." Though we cannot indeed fix the dates of these stones, we can with tolerable accuracy determine certain characteristics of the different ages within which they were erected. These are divided by archæologists into three great periods preceding historic times. First, the age of rough chipped stone; secondly, the age of the polished stone; and thirdly, the age of bronze. Each of these periods doubtless overlapped or ran into the other. Thus, unquestionably, in these monuments, which, by their appearance, may be supposed to belong to the rougher age, when the rude stone axes and knives would seem to have been coarsely fashioned by the simple process of chipping, are also to be found weapons of silex, and other stone of exceeding polish and sharpness. We are, therefore, as yet unable to say positively whether they were all erected in the second, or in the first of these stone periods. But the great number of polished stone implements discovered in them has induced the belief with many, that if any of these monuments were erected in the age of the rough or chipped stone, they must have been used subsequently during that of the polished stone, and the same remark may be made as to the age of bronze.

Against this theory, however, very serious objections can be raised. It is evident, that by far the greater number of these dolmens—probably all—were covered by their respective tumuli. With time, many of these mounds have been leveled, and the dolmens exposed. But if the others still under their tumuli contain implements of both the rough and of the polished stone periods, the question presents itself—may not all these artificial mounds have been placed over the dolmens at a period later than that of their erection? or may they not have been opened at a subsequent period, and then again closed? We have no evidence that either of these suppositions is founded. The inference is therefore strong that the mounds and dolmens are of the same period, and that period must have been the age of the polished stone. But though we cannot fix the date of the erection of these monuments, I believe that the objects found in them will aid in tracing the races to which these remains owe their origin. These monuments indeed are called

"Celtic." This, however, is a somewhat vague term, for it may be said that with the ancients, and especially with the Greeks, this term meant little else than a general appellation given to the people of the northern and central parts of Europe, of whom, in the time of the Greeks, little was known. Ethnology has increased our knowledge of the subject, but that knowledge is still very imperfect. With us the term "Celt" is now generally applied to races, part of which are known as Gauls or Gaels in the northern and western part of Europe, and some of which are of light complexions and hair and some of dark hair. But many ethnologists and historians draw a distinction between the "Celts" and the "Gauls" or "Gaels," classing the former as the dark, and the latter as the light-haired men. Both are found in the Morbihan. It is contended that the "Gauls" or "Gaels" conquered the "Celts," and that both were then confounded under one name—the "Celts" taking the appellation of their conquerors. These "Gauls" or "Gaels," were, therefore, either fresh emigrants from Asia, or descended, like the "Celts," possibly, through ages from the earliest Aryan emigrants, who, from their long settlement in Europe were for a long time considered indigenous, because they had lost all recollection of their origin.

If then these monuments are due to the earliest emigrants, we cannot as yet compute the immensely remote date of their erection. If, however, they are the work of either the "Celts," or of the "Gauls" or "Gaels," that date, it would seem, must be placed back, at least, to the fourteenth or sixteenth centuries before our era. But much doubt covers both questions—of race, and date.

Will these questions always remain a mystery? The hieroglyphics of Egypt, before the labors of Champollion, of Lepsius, and others, were deemed illegible. They may now be read with remarkable accuracy. The Assyrian wedge-shaped marks or cuniform inscriptions no longer withhold their lessons, and science is applying its searching glance to these "so-called Celtic remains" of Brittany. What secrets indeed of the material world are unfathomable to patience, acute observation, and time? If it be true that Cuvier could construct the model of the most rare specimen of natural history after inspection of a single bone, may we not hope that, upon these monuments and their sculptures, science may yet

breathe, and make them live for our intelligence? These silent stones may yet speak to us with no uncertain voice.

In this branch of knowledge, as in others, research will, in time, probably reveal facts which may give us a sure starting point for fresh investigations. And it is upon *facts*, and not upon mere theory or conjecture, that all sciences must rest. Thus resting, their results add to our bulk of ascertained truth. What, indeed, are all our sciences but segments of one vast whole, which, in view of the shortness of our sojourn here, we cannot master in its unity, and which we therefore divide into sections, to which we give the conventional terms of distinct sciences? These, however, touch each other, and form the great circle of Truth, which starts from the very throne of all Wisdom, touches in its circuit the universe at every point, moral, intellectual, and material, and leads us back to the source of its Divine origin. If this is so—and so it must be, since truth is man's heritage—we may then boldly push every science to its utmost legitimate limit, knowing that it can never conflict with the great whole of which it is part.

RECENT JOURNEY OF EXPLORATION ACROSS THE
CONTINENT OF AUSTRALIA ; ITS DESERTS,
NATIVE RACES, AND NATURAL
HISTORY.

BY

MR. JESS YOUNG, F.R.G.S., F.R.A.S.,

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Australia, or New Holland as it was formerly called, about which I am to speak to-night, is, in respect to its natural formation and products, no less than in the manner of its rapid settlement and development, worthy of more attention than is generally given to it by those who are not directly or indirectly interested in its progress, its welfare and description. Vast deserts of stones and arid sands; winds from the north that blow hot and those from the south cold; black swans, as well as those which are white; trees that cast their bark instead of their leaves; tulips and lilies that grow high in the air, and ferns which grow big as trees (where the fauna consists almost entirely of the nearly extinct marsupial); the duck-bill Platypus, a curious animal, half bird and half fish (*Ornithorhynchus anatinus*), is also found and wondered at;—these are but a few of the natural wonders of this strange clime, which lies far on the other side of the world, where the sun is now shining, and where the midnight chimes are being rung while we are at our noon-day meal, and the blasts of mid-winter, which, by-the-bye, are not very cold, sweep over the hot and parched country during our summer months. Since I should only bore you by going into any geographical details and statistics, and as time will not allow me to go into these subjects as thoroughly as I should wish, I propose to leave them out; those who already know them will probably here give a sigh of relief, and those who do not can solace them-

selves by knowing that those particulars are recorded in, and can be read from, any geographical school-book. There are, however, one or two later discoveries than are usually written in those books, viz.: The northern territory of South Australia, which was formerly North Australia, now belongs to the colony of South Australia, and is under that government. The French claim to have discovered Australia in 1503, but the first authentic record that we have is a map by the Portuguese, of an expedition under one Manuel Godinho de Heredia in 1601. It, however, remained wholly unexplored and virtually unsettled by civilized man until the present century, when the efforts of the British Government and the discovery of gold combined caused a rush to its shores, and villages, towns and cities were rapidly built and populated. The fact that so little is known about one of the most civilized quarters of the globe, is due to a variety of causes. About the time the colony began to assume importance the discovery of gold in California centered our attention. The Anti-Slavery contest, the great civil war, and the Know-Nothing excitement kept our nerves strained upon the events at home. Within the past ten years, however, our attention has been called to it, and shipload after shipload from this and other countries has been sent from the surplus population to new homes in the less thickly inhabited lands of the Antipodes. Three years ago, from an office in London, England, where they ought to know the whereabouts of the British Colonies, a letter was sent addressed to the Chief Secretary of Victoria, New South Wales, South Australia, which is similar to a letter addressed New Orleans, Wyoming, New York.

Australia is the largest island in the world, having a superficial area of 2,975,000 square miles, a very little less than the whole of Europe. Its greatest length is 2,536 miles, and its greatest breadth 1,585. Its length lies between the Indian Ocean on the west and the Pacific Ocean on the east, and its breadth between the Arafura Sea on the north, and the South Pacific Ocean on the south. Australia can boast of none of those great mountain chains, lofty peaks or mighty rivers which Americans are accustomed to see; but Sydney and Port Darwin Harbors are probably as useful and grand as any in the world, not excepting Rio de Janeiro, Constantinople, Hong-Kong, or San Francisco. There are no great inlets except the Gulf of Carpentaria on the north coast. The enormous expanse

of country is almost entirely level, and geologists have puzzled over its formation. There are many indications that it was once the bed of the ocean. The interior was, until within a few years, as a sealed book; and even now the knowledge concerning it is not very general.

It is known that vast deserts exist, wholly without water. Absence of mountain ranges explains the absence of rivers and its general aridity. The highest range of hills is the Warragong, or Blue Mountains, which attain a height of 7,000 feet above the sea level. Despite the absence of highlands, the scenery is grand in the extreme, its wildness being diversified by immense precipices and gigantic fissures.

There are a great many salt marshes and lagoons in the centre and west, and in the east a few rivers which alternately expose their dried beds to the baking rays of the sun, and overflow their banks. Long and severe droughts sometimes prevail. In 1865 there was no rainfall in Central or South Australia, and cattle and sheep died by thousands every day. The largest navigable river in East Australia is the Murray. It has tributaries in the Darling, Murrumbidgee and others. In Western Australia there are the Murchison, Gascoigne, Fortescue, and De Grey. Many of the smaller rivers have their rise in the mountains and run inland, losing themselves in the hot sands of the desert. The continent is divided into five colonies; the largest is Western Australia, with an area of 978,000 square miles; its capital Perth, on Melville Waters of Swan River—a beautiful little place, settled in 1829. South Australia, including the northern territory, includes 906,858 square miles; its capital Adelaide, on the River Torrens. This colony was founded in 1836. Queensland is the next in size, consisting of 678,000 square miles; its capital, Brisbane. Then comes New South Wales, with an area of 323,437 square miles; its capital Sydney; and last, but not least in importance, is Victoria; it was settled in 1834, was originally a part of New South Wales, but was made a separate colony in 1851. It is separated from South Australia on the west by the 141st meridian of east longitude, and from New South Wales on the north by the River Murray, or a straight line from Cape Howe to the nearest point of that river. Victoria owns no part of the Murray the south shore being the boundary line. Her area is 86,831 miles—2,200 miles less than Great Britain. The colony, as you will ob-

serve, is situated within the most southeasterly portion of the continent, and its most southern headlands enter the temperate climate of the fortieth parallel. The mean temperature of Melbourne is $58^{\circ} 8'$, which is 8° higher than that of London, although the latter is $13^{\circ} 11'$ nearer the frigid zone than Melbourne, showing to what an extent Europe is indebted to the Gulf Stream for its warmth. Victoria probably is the richest, most prosperous and most thickly populated of the colonies; though by statistics New South Wales appears to be now wresting her laurels away. The colony owes its wonderful success to the gold discoveries of 1851, which in the year 1852 amounted to \$70,000,000. The gold is generally found in quartz, granite and pophyry. New South Wales and Victoria are the largest gold-producing colonies, though each of the others add something to the enormous general yield. South Australia is noted for its copper; the Moonta, Wallaroo and Burra-Burra copper mines are all widely celebrated. Lead and iron, tin and maganese, and quicksilver are also found; the iron being widely distributed.

PREVIOUS EXPLORATION.

It is but recently that we have had any idea of the geography of the western half of the great Australian continent, and it is to the spirit of enterprise shown by the Hon. Thomas Elder of Adelaide, and by the governments of South and Western Australia, that a knowledge of it is due. The means placed in the hands of explorers by Mr. Elder, for years past, entitles him to more recognition than he has yet received; and I hold now in my hand a letter in which he says that it has always been his delight to identify himself with geography, and that he has much pleasure in forwarding to this Society a package containing the journals and maps of several of the explorers sent out by him, as also others in which he has taken an interest. Much has been done within the past four or five years to make known the character of that vast region, hitherto a sealed book to the world. Before describing Mr. Giles's journey across that waste, I will beg a few minutes to give a brief *resumé* of previous explorations, and point out the difficulties which the settlers and squatters encounter in pushing their way inland.

You will see that the continent is divided into two nearly equal parts by the overland telegraph line running between Port Augusta,

on the south coast, and Port Darwin, in the northern territory of South Australia, on the north coast. About thirty years ago, Ludwig Leichart undertook to explore the northeastern part of Australia. His first trip was successful, inasmuch as he accomplished what he undertook to do; the second time he turned back famished; and the third time he bravely started to cross from east to west, and has never since been heard of. Only a few bleached bones of horses, and some marks upon one or two trees, have been found to indicate his fate.

In 1841, Mr. Eyre—perhaps better known as Governor of Jamaica—made a march from Adelaide to King George's Sound, the record of which is filled with the most horrible details, thrilling incidents, and terrible tragedies in the history of Australian travel. He had one white man as companion and three natives. After they had been out some time and became short of provisions their horses nearly all died, and while Eyre was watching to see that they did not stray, his attention was drawn to the camp by the report of firearms. He hurried back to find his companion in the last agonies of death, and two of the black fellows gone with the firearms and provisions. He continued his journey with one boy. After undergoing terrible hardships, he received assistance from a French whaler, which enabled him to reach the western coast in safety. The Royal Geographical Society of England awarded him the gold medal.

The same country was traveled by Mr. John Forrest, in 1869, with comparative ease, showing that the pioneers of any country have much greater difficulties to encounter than those who follow after them.

Captain Sturt, in 1841, endeavored to make his way north, but only reached one-sixth way across, and returned after suffering the greatest hardships and privations. One man, Poole, died of exhaustion on the trip.

Mr. Gregory also tried to penetrate the interior, accompanied by my friend the Baron Von Mueller, the able Government Botanist of Victoria.

And here, before this Society, let me tender my sincere thanks for the skillful way in which he, at great trouble, classified the plants I collected when traveling with Mr. Giles. Gregory found nothing but sandhills and spinifex.

John McDougall Stuart, the most renowned of Australian discoverers, in 1858 and subsequent years made expeditions north of Adelaide, in the endeavor to cross from south to north. His third attempt was successful, though fearful hardships were undergone, and the overland telegraph now marks his track as a lasting monument to a great man's work.

Frank Gregory was the next to try from the north coast, but only succeeded in getting some 200 miles inland, when he was turned back by the same barren country that stopped his brother.

Mr. John Forrest in 1862, and Mr. Hunt in 1864, and later still Mr. Alexander Forrest, and several others, tried from the west coast to get inland between the twenty-ninth and thirty-third parallels of south latitude, but dry, salt lagoons, samphine flats and scrub drove them all back.

Mr. John Forrest's expedition was sent out in search of Leichart, or traces of that important expedition, but none were found, and the party was driven back, like the rest, for want of water.

The costly and celebrated expedition of Victoria, sent out by that Government under charge of Richard O'Hara Burke, generally known as the Burke and Wills expedition, should not be forgotten. The party reached the Barcoo River or Cooper's Creek, from Menindee on the Darling, with little difficulty. Burke and Wills, leaving the main body on the creek, with two men left to try and reach the north coast, leaving orders that, if they did not come back by a certain day, the main body of the expedition was to return to Melbourne without them. The unfortunate men arrived just seven hours too late. They were too exhausted to follow; were without food, and had lost one of their party. The Victorian search expedition under Howitt found the one man who was sole survivor reduced to a skeleton, and lying in a native hut, some months afterwards. The unhappy man had subsisted for a long time on nardoo, the seeds of a species of wild corn. One of the men was left on the road down from the coast, as he was unable to travel on account of extreme exhaustion. The last entry in Wills's diary was, "My pulse is at forty-eight; my legs and arms are skin and bone, and, like Mr. Micawber, I must wait for something to turn up." Four expeditions were sent in search of the lost ones—two from Queensland, one from South Australia, and one from Melbourne. Howitt, the commander of the one which was successful, brought into Adelaide

the remains of the unfortunate men the same day that Stuart was received with honors for the very feat that Burke and Wills had accomplished.

Colonel Egerton Warburton tried now from the great Australian Bight, but after some eighty miles the old old story was repeated—he was forced to return, to save the lives of the party.

In 1872, Mr. Ernst Giles set out upon an expedition with two men and a few horses. The expenses of the undertaking were borne by gentlemen of Victoria. His starting point was Chambers' Pillar. Proceeding along the River Fink, he found dry creeks with an occasional water-hole; he travelled over sandhills, and through mulga scrub, with an occasional oasis to keep him from perishing. Shortly after leaving the telegraph line, the head of a huge lake (Lake Amadeus), with arms like an octopus, effectually put a stop to his further progress. The lake was dry blue mud, with thick encrustations of salt covering its bottom. Giles reluctantly returned, owing, I believe, to the disagreement of members of his party. The mulga scrub spoken of is an acacia, and generally grows on the desert. I do not know if I am justified in calling it a desert, for there is plenty of vegetation. This, however, is indicative of the excessive dryness of the soil and climate. So dry is it, so little radiation is there, that I have often left delicate instruments uncovered in the open air all night, and never found the slightest particle of rust from dew or other moisture.

The year 1873 will long be noted for its explorations. The Government of South Australia in that year fitted out an expedition to solve the problem of the waste. Mr. William Gosse was the commander. He was well supplied with camels by Mr. Elder's courtesy, with horses, men, provisions and a dray, but after 600 miles of the same dreadful burning sands, spinifex, sandhills and samphire flats, he was driven back. Mr. Gosse was a scientific surveyor, and much valuable data was gained by his journey.

The same year Colonel Egerton Warburton, then an old man, undertook to reach the western coast. He was well supplied by Messrs. Elder and Hughes with camels and everything required. Accompanied by his son and some other men, he started to cross a country barren in the extreme, was driven north for lack of water, and finally arrived on the Oakover River. His party was in a terrible condition, and were then starving upon one teaspoonful of

flour a day. For nine days Warburton, worn out by starvation, was strapped upon a camel's back. When the river was reached he was carried into the water, and some of his party went in search of a station, known to be a short way off. After they had been gone some time Warburton had to kill his last camel for food. He thought there was a station seventy miles distant and expected relief, but the station was really 170 miles away, and when help arrived he and his companions were found too weak to stand up, and crawling about on their hands and knees. Warburton received the gold medal of the Royal Geographical Society, as also an honor from Her Majesty in the shape of the decoration of Commander of St. Michael and St. George.

Giles, undaunted by his previous failure, once more set out from the telegraph line, this time just far enough south to escape the dreaded Lake Amadeus. He was accompanied by Mr. Tietkens, and had two men and twenty-four horses. As on previous occasions, enough water was found to justify a halt occasionally, but generally only a hole in the sand or a clay pan, which was soon emptied. Generally they passed through good mountainous country, but the natives were very troublesome. The party soon ran short of provisions and began to eat the horses; and an explorer's horse is not an appetizing dish. I have seen a poster in New York on some of the walls, which is a capital picture of an explorer's horse. It is called—No "Time" here. They found one excellent patch of country where melons, pumpkins, corn, wheat and cucumbers grow well. The seeds were sown by the party, and on their return the fruits were found ready for the table. They camped here for some months.

A most remarkable case of endurance occurred on this expedition. Mr. Giles and a man named Gibson left the depot with four horses and a few gallons of water to go in search of another water-hole. After traveling for one hundred miles they hung up in a tree one five-gallon keg of water and two water-bags, and then turned two horses back, imagining that they would return in their old tracks to the camp. After following the trail for two miles, however, the perverse animals turned off and went south. Mr. Giles pressed on with the other two horses, a little water and a few strips of beef. One of the horses gave out after traveling sixty miles farther, and he decided to send Gibson back upon the remain-

ing animal, with instructions to take half the water left in the tree for himself and beast, and leave the remainder. The man was further instructed to go to the main camp, obtain assistance and return to Mr. Giles at the tree where the water was. Gibson arrived at the tree, took half the water and went on, but, unfortunately, he followed the tracks of the horses going south instead of going to the camp. In the meantime, Mr. Giles walked back through the soft white sand sixty miles to the tree, where he found the water-keg and a few small strips of beef—probably five ounces. He sat down exhausted to await the arrival of the relief party. He, however, still went on after resting, and his surprise, grief and mortification were intense when he found that the horses turned adrift had gone off the track, and that Gibson had followed them. Carrying the keg of water on his back, he set out towards the camp on foot. He went on for several days until, worn out and famished, he stretched himself upon the sands. While thus prepared to give up the ghost he observed a small opossum in a tree. Hoping to obtain enough food to give him a little longer hold of life, he drew his pistol and fired two shots at it, but missed both times. There was only one charge left in the weapon. Everything depended on the last shot, and his excitement was so great that he did not dare to fire for several minutes, fearing he would miss, and thus lose the last visible chance of saving himself from a fate too horrible to be thought of. His last shot was fired with trembling hand, and the animal leaped lightly away, unharmed. Giles did not even then despair. He had then traveled 120 miles. Food he had none, and as the water was exhausted he abandoned the keg. Crawling upon his hands and knees, he still went forward until within twelve miles of the camp. Here he picked up a young opossum which the mother had dropped from her pouch, and devoured it ravenously, skin and all. This prolonged his life a little, and he was found by the main party still crawling on his hands and knees, the flesh wasted to the bone, delirious from famine and fatigue, yet still keeping on the track. After a few days he became strong enough, the party set out in search of the missing man, but although they traveled four days along the tracks of the straying horses they could not find him; but his trail was seen still leading south. The safety of the expedition compelled them to reluctantly abandon the search. Three years afterward Mr. Giles went again in search of his lost

companion, but no traces of him were ever found. He was probably devoured by wild dogs, which roam those dreary solitudes.

In 1874 Mr. John Ross, fitted out by Mr. Elder, tried to push his way west, but returned with the same dismal tale, after traveling some four degrees of longitude.

Very soon after the arrival of Colonel Warburton in Perth, Western Australia, where he came from Roeburn in a sailing vessel, the government of that colony fitted out an expedition under John Forrest, who was destined to bring to a successful issue an undertaking requiring coolness, nerve, and determination. His party consisted of four white men and two black. They had plenty of horses, with a good outfit. He followed up the Murchison River, and then struck across for the telegraph line. After much privation the party was fortunate enough to strike Giles' Furthest West of his second expedition, which facilitated their further advance. When Forrest arrived in Perth, after an absence from civilization of six months, he was received with much éclat, and received the gold medal of the Royal Geographical Society.

Having given the brief statement of a few of the principal expeditions in the exploration of Australia down to 1874, I shall, before entering upon the one in which I took part, give a short account of the aboriginal inhabitants, the geology, flora and fauna of this great continent.

It will be impossible for me to give any lengthy description of the fauna or flora, botanical or geological resources of Australia, and I shall therefore only deal with them very casually. To the botanist Australia presents a wide and varied field. Almost all tropical trees and plants grow, while eucalyptus trees (*Eucalyptus globulus*) are of enormous growth, 350 to 400 feet high, and I believe that one specimen in the Warragong range is lying on the ground, which measures 420 feet in height, or rather length. There casuarinas, acacias, banksias, hakeas and leguminosæ species predominate, while there are endless varieties of ferns. A peculiarity about the trees is that they begin to die at the top and die downwards, and that they usually shoot the bark instead of the leaves. There is an absence of edible fruits, except a few berries and a few small indigestuous peaches. There are several poisonous plants, which deal destruction amongst cattle and sheep. The grass tree (*Xanthorrhæa*) also grows and is very common; they are called black boys in

Western Australia, because at a distance they look so much like natives. Once, while watching for a surprise at dusk from natives, I fired at a grass tree which I had not noticed. I heard the ball strike, and was alarmed not to see my victim fall and to think that he was so invulnerable. The scrub so often alluded to may be anything, but is generally mallee, or a species of eucalyptus. It covers fully one-fifth of the whole colony, and the monotony of traveling through it can only be understood by experience. For days and weeks and months you may be in it without seeing twenty yards in any direction. It is in this scrub so many lives have been lost from time to time.

The geological formation is for the most part composed of primary rock, which forms the bed of table-lands. This is pierced and rent occasionally by other igneous rocks of trappean formation. These are occasionally heaped into mountains, but they generally present a gentle undulating surface, or form ridges of rounded contour, but of little height. They are interspersed with strata of rocks of metamorphic origin. Rocks of the secondary stage prevail on the coast. The most notable of them is the carboniferous, and the plains of the western interior are tertiaries and recent sedimentary deposits. The present conformation of the territory is doubtless due to the volcanic origin, though no recent action is apparent. On the northern coast the principal formation is a hard ferruginous sandstone.

The zoology of this immense tract of land is peculiar and interesting. It is distinguished by the great majority of marsupial or pouched animals, of which there are now few traces in any other part of the world. A few species, I believe, are still to be met with in America, closely allied to the Dasyures of Australia. Fossil remains are found in England and France, indicating that they existed there at a very early period, when other animals of this age were in their infancy. As you probably are aware, it is generally supposed that the mammalian tribe was developed from the marsupial. There are no ruminating animals, no pachydermata, and no carnivora, except the native dog or dingo. The kangaroo affords sport and food for the natives; and I have had many an exciting hunt after them. There are a great many species, and some of them will weigh more than 200 pounds. Kangaroo tail soup is considered an excellent dish. When the kangaroo is attacked and brought to bay, some of

the "old men kangaroos," as they are familiarly called, are very fierce, often killing the dogs and occasionally making it so dangerous for the hunter that there is a special charm in the chase, independent of the riding. The dogs used are generally a cross between a staghound and a greyhound, or a bloodhound and greyhound. They are much hardier than the greyhound, though not so nimble. Water and some beaver rats, belonging to the placental series, are peculiar to Australia. Upon the lakes and rivers in the north are found the black swan, the crocodile, dugong and turtle. In New South Wales the wallaby and the bandicoot, the wombat and the opossum, make their home, and also the native bear, who is not the terrible beast so little sought after in the west of the United States, but a poor harmless brute, with scarcely energy enough to move.

Birds in Australia are numerous. The emu is the largest, and somewhat resembles an ostrich, with which you are probably more familiar. There are swans, pelicans, geese, eagles, hawks, quail, pigeon, crane, heron, and the elegant native companion, parrots and parroquets in abundance. The reptiles are really beautiful—crocodiles in the north, and snakes, lizards, scorpions and centipedes in the south. I shall not readily forget the sensation I experienced when one night a huge black centipede, eight inches long, crawled upon my neck with his horrible sixty-four legs, and made his way to my feet leisurely, much to my disgust; and though he was probably only a few seconds, I thought him slow. He is in the Museum at Adelaide, with all the whiskey he can drink. Insects are wonderfully prolific, mosquitoes and flies being particularly abundant. The native children are sometimes hardly recognizable, so completely are they covered with flies, filling their eyes, noses and mouths. When eating, it requires dexterous manœuvring to get a piece of meat into one's mouth without its complement of flies. It is essential on the river and creek bottoms to wear a fly-netting constantly about the head. Spiders are very common, as also are ants, the tarantula being the most formidable of the former and the bulldog-ant the worst species of the latter. These ants are an inch or more in height and about two inches long. They all fight fiercely, and their sting is not at all to be desired. They catch hold of your skin with their nippers, bend the body under like a scorpion and put the sting gently in, leaving the venom and sometimes the sting

itself. When camping near a nest of them, we generally thrust a firestick in the hole, which has the effect of keeping them at home.

The fish are whales, seals, sharks, codfish, snappers, mullet, and hosts of others not found in any other part of the world.

The natives of Australia are a much maligned and misunderstood race. They have generally been described in one category as the most depraved and degraded of mankind, some going so far as to say that they scarcely deserve to be called human beings; that they are cannibals, and torture their victims with much cruelty. Such accusations are false in the extreme, and can, I think, only have been used as an excuse for their extirpation, which is taking place rapidly, as was the case in Tasmania years ago. Many Australian tribes are already extinct, and in the course of another century or so an Australian black will be looked upon as an individual of a by-gone age; for as the white man advances in search of new pastures for his flocks and herds, he drives the native back from his home and hunting-grounds. The invasion is disputed for a time, and the revenge, which generally reflects back to the savage, with the introduction of fresh style of living, and to them new diseases—tobacco and spirits—soon, if they are not killed outright through self-protection, so undermines their constitutions that they soon succumb to its certain poisonous influences. Protectors of aborigines have from time to time been appointed in each colony, but what can they do other than give these natives blankets and food, under certain conditions, which of course are never kept, and the protector's provision goes generally for tobacco or spirits, or both, and they are worse off than ever. This is very much the same case, I imagine, as the Indian of this country and the Indian agent. The Australian black is not naturally so depraved as many other races better cared for and better known. Though many writers declare they are cannibals, one going so far as to describe the searing of the skin with a fire-stick, the peeling of the skin with a piece of flint, and the nails, and finally building a fire for the roast; that they eat their friends, whether they are killed or die; but never toast their foes with any cannibalistic designs. I have never found any traces of such habits, either torture, cannibalism, or scalping; any native whom I have asked has scouted the idea with disgust; and I have seen their graves and heard them burying their dead. The tribes, however, differ so in different parts of the continent, that what is

probable, and even true, in one location, would be false and ludicrous in another, and the knowledge of any such news to the strange black would be received with incredulity. Writers have always had to deal with natives on the coast and on rivers, where they are much finer specimens of humanity, better fed, and drink good water, owing to the rivers having good food and water in their contents. Those living inland are smaller, thinner, and dirtier, but I never found them very bloodthirsty; they are treacherous, as are all uncivilized races. Religion they have little or none, though they believe the spirit is immortal; they believe that the dead sometimes return in another shape, hence the reason they carry him round and round the grave at some distance, in order to puzzle the dead man as to his whereabouts. They are also in abject terror of an evil spirit, called Chinchí. Buckley, an escaped convict, who lived with the natives for thirty-two years, tells that they took him for the spirit of a deceased chief, especially as he made his appearance to them with the dead man's spear-head, etc., which he had picked up on his grave. There seems to be no government amongst them; but where anything is in dispute, it is referred to one or two of the oldest men for arbitration. Their arms consist of two kinds of spear, one long and heavy, and one very light; the former for warfare, and the latter for the chase; the war spear is barbed with six or seven pieces of flint, stuck on with gum from the grass tree or blackboy (*Xanthorrea Quadrangulata*), and bound on with the sinews of some marsupial animal; these spears are projected by means of a wommera, a light, flat piece of wood, with a piece of bone bent back from one end; this fits into the end of the spear, and acts as a third joint of the arm, giving the spear great impetus, and I should not like to hold out my hand at sixty yards for a spearman to throw at. A thick stick, with a large knob on the end, called a waddy, is used for warfare, both foreign and domestic. They also use a wooden shield, a piece of wood three feet long and nine inches wide, convex on the outside, and hollowed inside with a bar across, through which the arm is thrust, and they are skillful in its use. The celebrated boomerang, described facetiously as a sort of returning board, because, I suppose, it is always uncertain as to its movements, is a curved piece of thin wood, which, by means of a combination of forces, can be thrown with great dexterity, making the most curious evolutions, and puzzling any one standing near as to

where it is going to stop. It is unsafe to take shelter behind a tree, for one may be taken in the rear or on the flank. There is also a sword—a piece of hard wood, from six to eight feet long, and nine inches wide, and half an inch thick. Two natives will have a dispute, which they will settle thus: one will put down his head, and the other will come down with his sword, stunning and felling his opponent; if he comes round, it is his turn to go at the first striker's head, and so on, until one or the other is satisfied. They are polygamists as a rule, and as the sexes are nearly equal in numbers, there are often disturbances; in fact, most quarrels are caused by the fair sex in that country, as in many others. Some tribes tattoo their faces; some bore holes in their nose, through which they put a piece of bone; others bore their ears, and some knock out a tooth. In winter they cover portions of their bodies with skins, and in summer go entirely naked—that is, where the gentle influence of the missionary or teacher has not been felt. They build a shelter of branches in wet or very cold weather, but generally sleep in a row, each in a trough scooped out of the sand, with a fire between. Their coiffures are varied, according to tribe and taste. They indulge in plenty of pomade and cosmetics; some wear chignons, others curls; some are lazy and slovenly, wearing their hair down their backs, others in a knot, and some in a queue—that is, amongst the men; the lubra's or wife's hair is always cut by her lord. The natives on the coast live on ducks, geese, emu, kangaroo, fish, etc.; and the interior blacks live on what they can find—wallaby, kangaroo, rats, snakes, lizards, grubs, etc., all of which are found good when one is hungry. In the spinifex country the shins and feet, through coming constantly in contact with the sharp spurs of the spinifex, or porcupine (*triodia*), have a corn, or hard skin, which acts as a sort of shield. This grass is the terror of men and animals; it was, I believe, the main cause of the return of Mr. Gosse's expedition. It is a grass growing in tufts of from four to six feet in circumference, and about three feet in height; in appearance very like the yacca, or soap weed, seen out in the west of this country. It is sharp as the finest needle, and to this day I have a lively recollection of being thrown from my camel into the middle of an unusually fine specimen, and landing in a sitting position; for days walking was painful, riding out of the question, and after which I had to eat all my meals standing. There are two kinds of the grass, one

growing on rocky places and in moderately good farming country, and the other in the horrible mallee scrub. I have eaten the young shoots, but when old it is worthless, unless some ingenious individual some day utilizes it for making paper, or something else. There is plenty of it.

A black fellow and his lubra will never go anywhere without a fire-stick; when traveling it is the duty of the lubra to carry this, as also her husband's spears, shield, boomerangs, and other impedimenta. She also carries from the water-hole any water that may be required for the camp. This is done in a vessel made by tying both ends of a piece of bark into a sort of canoe; and with it she carries her fire-stick, waving it backwards and forwards, in order to keep it alight. The camp is seldom pitched less than a quarter of a mile from the water. Were it pitched nearer, animals and birds would not come and drink, and so give the native a chance of getting some food. A native will wait patiently for hours cramped up in a small water-hole, waiting for a chance of using his spear or boomerang. An Australian black fellow is not very gallant, as may be inferred from my previous remarks; his dog gets much better treatment than does his lubra. She sits alone and behind him during his meals, and if he comes across anything objectionable in the way of sinew or gristle, it is thrown over his shoulder to her if the dog cannot manage it. There are one or two tribes that adopt a noteworthy way of treating a baby. When a child is born, the attendant buries him up to the neck in the hot sand. A two hours' sojourn in the desert sand is an excellent way of initiating the young negro into the hardships of this wicked world; and then he comes out well baked—a glorious remedy for infantile chilliness of feeling. He is handed at once to his delighted mother, and the whole thing is ended.

The natives are fond of dancing, and every new moon hold a grand corroboree, or camp dance, generally painting themselves to look like skeletons, bedaubing the ribs, spine, and other prominent bones with white pigment, which gives them a ghastly appearance. They also use Wilga, which is red ochre and charcoal, mixed with grease. The women at these dances beat time on a sort of drum, formed by a skin stretched over a piece of wood, or across their knees. Most fantastic is the dance which ensues, and almost perfect time is kept. They are extraordinary mimics, and during the

corroboree, the jumping of the kangaroo, the long ungainly stride of the emu, or any peculiarity in the gait of a friend or enemy, is enacted amidst the hearty plaudits of the onlookers. There has not as yet been found any bones or fossil remains of the human race, or any weapons or implements to indicate the antiquity or description of man; and it is within the limits of possibility that the present aboriginals are of Papuan origin, having been in communication with New Guinea when Australia and that island were one, which is also possible, as the channel now between the two islands is only 70 miles wide, and in no place more than 60 or 70 feet deep, and if there is an upheaval in one part of the continent it is probable there will be a depression in another; the distribution of fauna in both also pointing to the conclusion that they were formerly connected.

I shall now, ladies and gentlemen, conclude my paper with an account of the last expedition, being the one in which I participated. In 1874 Mr. Elder determined on sending an expedition across on the thirtieth parallel, about 400 miles south of Forrest's course, to the city of Perth, and so set at rest the conflictive surmises of what really was in that much dreaded country. Mr. Giles was selected to be the leader, and he made his old associate, W. H. Tietkens, second in command, while I had the honor of acting as observer and naturalist, under instructions from Mr. Elder to go up to his large station north at Beltana, and get arms, ammunition, and camels ready for our departure, and await the arrival of Mr. Giles and the other members of the party. One hundred miles by rail brought me to Burra-Burra; I then had 180 miles to ride in the most springless, rickety coach imaginable, and as it generally went at a foot pace, and made frequent stops, I preferred to walk—excellent training, but rather tiresome. From Blimman, where there are copper mines, I rode on horseback to my destination. My baggage, including the blankets and clothing, only weighed thirty-two pounds, and consisted of two flannel shirts, two pairs of socks, two pairs of leather inexpressibles, and two pairs of boots, besides the things I then wore. I got all our provisions ready sewn up in green-hide bags, as a protection against the scrub.

The latter end of April Mr. Giles arrived, having come up from the south coast, where he had been exploring near Fowler's Bay. He lost all his horses coming through; two camels carried his party 220 miles without water, besides carrying enough to supply the

horses while they lived with a bucket of water each day. They passed through a horrible country, and suffered greatly.

When all was in readiness, we left Beltana with five white men, two black boys, two camel-drivers, and eight months' provisions. One camel-driver became exhausted the first day, and was sent back. These camel-drivers have religious observances that sometimes are annoying. It is their custom to pray five times a day, and although we did not object to their worshipping, we dislike to have them wait so long; so, to make them quick, we took the camels on, so it was with difficulty they could catch up with the party again. Their zeal for prayer generally exhibited itself at times when we were obliged to stop on account of a broken nose-line, or some other mishap. We had three kinds of camels—bulls, cows, and bullocks. The idea of using bullocks had always before been scouted, but we risked taking them, and found them to have very superior qualities of endurance, better than either bull or cow. The latter we used for riding, and the others for beasts of burden. They carry great weights. Our average was 500 pounds at starting, and I have seen one old fellow we had laden with half a ton. We stopped at Port Augusta a day or two, and then made our way northward to the west of Lake Torrens, a dry salt lake, to Elizabeth Creek.

Shortly after our arrival at Lake Gairdner, we crossed the tracks of Mr. John Ross, whose failure I have already mentioned. As we left Mount Finke with only ninety gallons of water, we could not afford the extravagance of making tea, since too much of it would be wasted in the shape of steam. On the second day it commenced raining, and we had to stop on account of the saddles getting wet. A damp saddle on a camel's back is not comfortable, and the camels do not like it any more than the riders. Camel-riding is generally as safe as the rider chooses to make it. The ordinary saddle consists of three wooden crutches, fixed at a distance of eighteen inches apart, on two bolsters, which fit along the camel's side, the hump being immediately under the second crutch. This arrangement keeps the saddle off the camel's loins and shoulders. Between the crutches the traveler puts his blankets, and other scanty luggage. On the sixth day out, we had our first experience in eating the grub, a chrysalis found in the roots of trees. It is about as long as one's finger, soft and juicy, but with a hard head, crushing of which is objectionable. The taste is peculiar, but one can acquire

a strong liking for it, if hungry. The natives cook it, but we did not.

From Lake Gardner our way was over the highest of sandhills and prickliest of spinifex, the densest of abominable scrub, and the most yielding of soft white sand.

From Mount Finke to Youldah our journey was not difficult. Though sand-hills were plentiful, the water-holes too were frequently found, and we arrived without mishap. Mr. Giles left Youldah, and went south to Fowler's Bay, taking with him one black boy and three worn-out camels. Mr. Tietkins, the second in command, and myself, with four camels and provisions for one month, started north mainly to find water for a future depot. We intended to push forward to the Musgrave range, previously discovered by Mr. Giles, and after recruiting there make our way back. We were fortunate enough to find in the course of 100 miles' traveling, a small water-hole containing a few gallons. We returned to the depot, and brought up the party. Mr. Giles having returned from Fowler's Bay, our party now consisted of seven men instead of nine, as at starting from Beltana. From this place, which is called Ouldabinna, Mr. Tietkins and myself again went north in search of water, while Mr. Giles, with two men, went west with the same object. We traveled more than 100 miles out, but were obliged to return unsuccessful, fearing the water at Ouldabinna would give out. The natives were very troublesome, and that fact also hastened our return somewhat.

We were wise in coming back so soon, for the water was rapidly diminishing. Three days later Mr. Giles returned, having traveled 150 miles west, and found a small native dam with a little water. As to turn back would be defeat, we determined to go to this little water-hole, hoping that in the meantime the skies might send down a shower to augment its scant supply. We set out for it, husbanding our little remaining water. Day after day, with the fierce sun shooting his fiery darts at us from a cloudless azure sky, we trudged wearily on. The glaring sand reflected the heat with terrible intensity and effect, scorching our faces and giving rise to a blinding mirage. Seen under these conditions, the desert seemed to stretch

"In airy undulations far away,
As if the ocean, in its gentlest mood,
Stood still, with all his rounded billows
Fixed forevermore."

On the tenth day we were in a terrible condition, and one of the camels died. That very night a cooling shower descended, and we were saved so far. But for the rain we certainly would have failed, because the dam was still distant two days' journey, and it would be quite dry through evaporation. After resting here a week, we had to traverse 337 miles, occupying seventeen days, without seeing a vestige of water. Without the rain, this would have made in all twenty-nine days and 517 miles—a period too long to be endured by either man or beast under the intense heat of that dreadful region. Leaving this refuge we traveled west, not knowing when we should again reach water or find a living thing. It proved to be a race for life. On the twelfth day we were reduced to such a pass that we held a council to decide how to dispense with some of the camels. We decided to take them all with us, trusting to Providence to help us out of our difficulties. And so we struggled forward until the seventeenth day, when the black boy found, to our joy and surprise, a water-hole sufficient to last the whole party a fortnight. We had great difficulty in restraining ourselves from plunging into the water and drinking freely; but, after a long thirst, such an indiscretion would probably have proved fatal. Under such conditions the tongue must first be moistened if very dry, the mouth should be washed out, and when the body becomes cool a small draught may be taken.

To the enterprise shown by Mr. Giles, in thus risking the fate of the party upon the chance of finding water, may be attributed the success of the expedition. Had we proceeded in the same manner as the other explorers, we should never have got 200 miles from home. Had we never left one camp until we found water to justify moving to another, we should probably have stopped at the first depot and returned home from there. At the point where water was so happily found we remained a few days to recuperate. We found there large wooden swords and a few boomerangs, indicating visits of the natives. None of them came into sight, but before the fierce luminary sunk into his grave below the sands and darkness fell, we could see the smoke of their bush-fires far away on the horizon. It would be difficult to describe the sentiments inspired by such a scene. The imagination found free play in wondering what strange scenes were being enacted around those will-o'-wisp like flames that danced over the darkened sands, and in picturing the weird, mys-

terious, wandering children of the waste gathered there, perhaps to celebrate some barbaric feast.

There is something awe-inspiring in the night that settles upon those mighty solitudes. Like a vast ball of molten brass, the day-god rolls down the evening skies, and scarcely has his golden disc disappeared below the horizon when darkness falls. The absence of the heavy banks of clouds that prevail in this latitude prevents radiation to any extent, and consequently there is none of the lingering "twilight gloamings" so dear to the poet's heart. There is no distant low of home-returning cattle, no dewy-fragrant breeze from flowery meadows, no chirp from nestling birds, and no smoke from cottage roofs ascending like incense in the evening air—none of the sights or sounds which we associate with the close of day. The sun has scarce disappeared from view, when all the starry hosts of the southern sky flash forth with a brilliancy unknown in northern latitudes. The heat given out by the sands renders the night air scarcely less ardent than that of day, and there is something solemn and impressive in the absolute silence that prevails o'er the earth and sky—not a leaf to rustle or the crackling of a twig to break the stillness. The croak of a raven, even, would be music to the straining ear. Lying around our little fire, kindled in the midst of this mighty desert, on a spot never before visited by civilized man, we gazed into the darkness that encompassed us, and giving wings to the imagination revelled in a realm where spinifex, samphire flats and water-holes were alike forgotten.

Mr. Giles sent two men ahead forty miles from Queen Victoria Springs with water, which was deposited in a canvas trough, so that we might give the camels a drink. The main expedition reached the spot in safety, and found the water had not been touched by the natives. It was given to the camels, and we traveled onward, having 220 miles to traverse through scrub and spinifex before reaching water again. Over this territory native hunting fires were seen day and night in every direction.

The picture of a native camp in a place where there is vegetation, is something like this: A few gunyahs of fresh-plucked boughs scattered about; a blazing fire of decayed wood, the smoke from which ascends perpendicularly in the tranquil air. Outstretched on the ground, men and women lie, some naked, others enveloped in blankets or rugs made of opossum skins. A few are seated, raven-

ously devouring lumps of half-raw meat, which they tear to pieces with their fingers. After a time shouts are heard in the distance, as the belated hunting parties return. The sleepers are aroused, fresh fuel is heaped upon the fires, the food brought by the newcomers is cooked and eaten in about the same fashion as a dog would dispose of a chop, and then the entire encampment joins in a wild, fantastic dance.

On one occasion we sojourned at a water-hole where several blacks came into the camp. We fed them and clothed them. That is, we tore a red handkerchief into thin strips and tied a strip around each head. The following morning a score of natives came in for breakfast, but we were fasting, and they had to imitate us. Seeing they could get nothing they departed, leaving three men and a girl about twelve years old with us. These stopped for three days. While we were at supper on the third day I noticed the blacks were very intently watching a neighboring rock. Leaving the rest of our party, I went to where the blacks sat, and scrutinizing the rock, soon saw two black heads cautiously make their appearance. I gave the alarm, and instantly there appeared about 100 painted warriors, with spears shipped in their wommeras. We were just in time, and our shower of balls and buckshot somewhat checked their ardor—in fact, cooled it altogether. I believe one or two of their party were injured, but none of ours was hurt. The three men in our camp had seized tomahawks to attack us in the rear. One of them got around our leader's neck and hugged him most persistently, but a blow from the butt-end of a rifle parted the loving couple immediately. In the meantime the little girl, who had been jumping about all day, trying to make us understand that we were going to be attacked, ran off, and we were left in charge of a collection of spent spears and war feathers. The following morning we heard the blacks mournfully wailing their lamentations for defeat. The sounds died away gradually, and we lost all trace of the party. They departed, and, according to custom, probably carefully avoided the burial spot thenceforth for months or years. After sunrise the girl came fearlessly into camp, accompanied by her intended husband. She was about 6 or 7 and he 19 or 20. We had given him on the previous day an old overcoat to cover his nakedness, and a shirt to the girl. The ludicrous appearance they presented coming into camp the following day was increased by the fact that they had exchanged gar-

ments. The man had donned the shirt, which was much too short for him, and the girl coquettishly sported the overcoat, which enveloped her from head to foot.

But to return to our expedition. From Ullaring our journeys were easy as compared with those we had made, the greatest distance to be traversed without water being only seventy-eight miles. We saw from the top of a small hill (the first we had seen since leaving Mount Finke) a range of hills to the south. These, we argued, must be part of Mount Jackson discovered by Gregory, and we thought that Mount Churchman, for which we were steering, must be laid down incorrectly on the maps. This, however, turned out to be incorrect, for Mount Jackson could never have been visited by the Western Australian explorers, or if it had been, the hills from which we saw it ought to have been also laid down. Our appearance at Mount Churchman astonished a party of natives, who were unable to account for the presence of white men in that remote spot. During the latter part of our journey we lived almost entirely upon lowan's eggs. This bird is the native pheasant. It builds a nest in the sand, constructing the bottom of dried leaves and small sticks. Upon this is laid a thin layer of sand, and the whole is covered up with small gravel and sand. Each morning the bird deposits an egg, with the little end downwards, almost in the centre of the nest, and covers it up again. This goes on until seven or eight eggs have been laid. The nest will now be about 12 feet in diameter and 3 feet high. She then covers the nest with an additional layer of sand, and leaves the eggs to be hatched by the heat of the sun. It has always been a mystery to persons of an inquiring turn of mind how the young birds get out of the nests. The lowan is only about the size of an English hen pheasant, but the eggs are as large as that of a goose. The shells are so thin that it is very unsafe to boil two in a pot together, or even one unless it is carefully wrapped in cloth. The general method of cooking is to stand them on end near the fire to roast. Some thirty or forty of these eggs were found every day, and the older eggs being of course more mature than the fresh-laid ones, were less highly prized by those members of the party whose delicacy of taste was not fully developed. Although we found so many nests, I never saw but one bird. That one I shot and we ate, being much too hungry to preserve it. We were all suffering by that time from scurvy and from

ophthalmia. On waking in the morning, half an hour was sometimes required to unseal and fully open our eyes. Our clothing showed the effects of rough usage; buttons were very scarce, and the man who could patch his clothing with pieces of the original material was regarded as a fop and treated as such by the others. Pressing forward, despite these obstacles, we reached a small sheep station, the most outlying one in Western Australia. The owner was so surprised and frightened by our sudden appearance that he fled at our approach, leaving us with a thousand sheep. His old black horse was not sufficiently fast to take him beyond our call, and he was induced to return. He gave us a sheep, and we made such an onslaught upon it that in less than six hours we had picked its bones. We stopped at this point two days, and forwarded a telegram to the Government announcing our whereabouts. A detachment of troops was at once sent to conduct us to the city of Perth, 180 miles distant. We were cordially and enthusiastically welcomed there, as well as in every city and town we visited. Banquets, balls, and no end of receptions were given, and warm greetings compensated for the hardships undergone.

Our work, however, was not finished here. Mr. Tietkens and myself were obliged to leave the party. Mr. Giles, with the remainder, returned overland between the tracks of Messrs. Forrest and Warburton. The route of the return expedition was to lie about 500 miles north of that just described, or between the twenty-fourth and twenty-fifth parallels. The first part of the journey was over ground previously traveled and settled. Crossing the head waters of the Murchison River, Mr. Giles made his way to Mount Gold, previously visited by Forrest. This curious eminence rises to a height of 2,600 feet above the sea level, and is made up of blocks of ironstone. The compass is consequently quite useless in its vicinity. The Gascoyne was dammed up, and plenty of water was found in the main channel. On the first day of May, Mount Labouchere was reached. This rises 3,400 feet above the sea level. The Ashburton River was reached by traveling through stone and scrub country. It was nearly dry. One small stream, however, was found flowing down its sandy bed. The Ashburton is the largest river in Australia, and had never been traversed so far up. The banks were found clothed with eucalypti, but the valley through which it flows is stony, and not suitable for pastoral purposes.

Leaving the Ashburton and traveling in an easterly direction, the inevitable desert of spinifex and sandhills was encountered, even where water flowed. Occasional strips of good country were seen. Ophthalmia again attacked the party, some members being struck entirely blind. The poison-plant was found at the head of the Ashburton, and most of the camels suffered severely from eating it.

The old, old experience of Warburton, Forrest and Gosse was encountered by Giles, although his party did not suffer so much for want of water as on the previous expedition. He traveled 220 miles in ten days without finding water, over sandhills, sometimes bare, sometimes clothed with foliage. Giles struck his old point on the Musgrave, and followed it down to Ferdinand Creek, previously discovered by him. This was found dry. He reached the telegraph line on the 19th of August, and found himself again amongst his fellowmen, and was received with that enthusiasm to which his plucky march so well entitled him.

As I am lecturing here only as the representative of the exploring party, I beg you will understand that I was not the leader of the party, and if you have any praise to bestow, you will give it to Mr. Giles, since we must give honor to whom honor is due; and if you wish to censure, please censure me for not relating the proceedings in a more satisfactory manner.

The facts obtained by all these expeditions indicate that the Central Waste is bordered on all sides by a belt, the greater portion of which is suitable for raising sheep and cattle. On the south there are many tracts which would make desirable sites for settlements, if water could only be brought to moisten the parched earth. While this fact is now regarded as an impossibility, some miracle of science may yet be wrought by which this vast desert shall be made to blossom as the rose. I believe water may be got by sinking, and, if so, millions of acres of beautiful country would be utilized. I wanted Mr. Elder to let me try, and he doubtless will on his return to Australia. There are in the middle half a million square miles (about one-fifth of the entire area of the continent) which offer nothing but barrenness and death to the bold invaders. The southern part of this wilderness is dotted with hills of soft, white, yielding sand, thickly clad with spinifex, scrub oak and other low shrubs, with an occasional group of eucalyptus trees. The northern portion of this desert is almost entirely destitute of even this useless

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